



LCIE



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TEST REPORT

N°: 20128157-793724-B

Version: 02

Subject Electromagnetic compatibility tests according to the standards:
FCC CFR 47 Part 15.225 & ANSI C63.10
RSS 210 & RSS-Gen

Issued to IDEMIA IDENTITY & SECURITY FRANCE
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Apparatus under test

↳ Product Vision Pass SP series
↳ Trade mark IDEMIA
↳ Manufacturer IDEMIA Identity & Security France
↳ Reference 293804418
↳ Model under test MPH-AC008A
↳ Serial number 2338SMK0000139
↳ FCCID ZBW-MPHAC008A
↳ IC 11472A-MPHAC008A

Conclusion See Test Program chapter

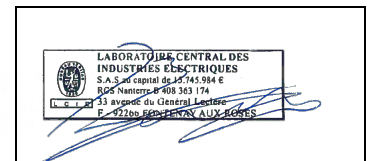
Test date June 22, 2023 to September 28, 2023
Test location LCIE Fontenay-aux-Roses & Ecuelles
FCC Test site FR0010 - 166175 (FAR)
ISED Test site 6230B (FAR)
Sample receipt date June 22, 2023
Composition of document 65 pages
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PUBLICATION HISTORY

Version	Date	Author	Modification
01	October 17, 2023	Laurent Deneux	Creation of the document
02	February 13 th , 2024	Laurent Deneux	Addition of tables in dB μ A/m (pages 50 and 53)

Each new edition of this test report replaces and cancels the previous edition. The control of the old editions of report is under responsibility of client.



SUMMARY

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1. TEST PROGRAM

References

- 47 CFR Part 15.225 (2022)
- RSS 210 Issue 10
- RSS Gen Issue 5
- ANSI C63.10 (2013)

Radio requirement:

Clause - Test Description	Test result - Comments
Occupied Bandwidth	PASS
20dB Bandwidth	PASS
AC Power Line Conducted Emission	PASS
Frequency Tolerance	PASS
Field strength within the band [13.110-14.010] MHz	PASS
Field strength outside of the bands [13.110-14.010] MHz	PASS
Receiver Radiated Emissions	NP(1)

This table is a summary of test report, see conclusion of each clause of this test report for detail.

(1): Limited program

(2): EUT not directly or indirectly connected to the AC Power Public Network

(3): Testing covered the receive mode, and receiver spurious emissions are considered to be the same as transmitter.

PASS: EUT complies with standard's requirement

FAIL: EUT does not comply with standard's requirement

NA: Not Applicable

NP: Test Not Performed

2. EQUIPMENT UNDER TEST: CONFIGURATION (DECLARED BY PROVIDER)

2.1. HARDWARE IDENTIFICATION (EUT AND AUXILIARIES):

Equipment under test (EUT):

Model under test:	MPH-AC008A
Serial Number:	2338SMK0000139
	
Dimensions:	10cm x 3.5cm x 21cm (Length x Width x Height)
Type:	Table-Top

Power supply:

Name	Type	Rating	Reference / Sn	Comments
Power supply	AC/DC	100-240V ;50:60Hz	FW7362/12	Not sold with the product
POE injector	AC/DC	100-240V ;50:60Hz	POE29U-1AT(PL)	Not sold with the product

NC: Not communicated by provider

Inputs/outputs - Cable:

Access	Type	Length used (m)	Declared <3m	Shielded	Under test	Comments
POE	Input/Output	RJ45	10	☒	☐	
Network	Input/Output	RJ45	10	☐	☐	
Power supply DC-12v	Input	L1-N	1.8	☒	☐	

NC: Not communicated by provider

Auxiliary equipment used during test:

Type	Reference	Sn	Comments
POE injector	POE29U-1AT(PL)	-	Not sold with the product
Power supply FRIWO	FW7362/12	-	Not sold with the product

NC: Not communicated by provider


Equipment information (declaration of provider):

Type:	RFID		
Frequency band:	[13.553 to 13.567] MHz		
Number of Channel:	1		
Antenna Type:	External without connector		
Transmit chains:	1		
Receiver chains:	1		
Operating temperature range:	T _{min} :	☐ -20°C	☐ X°C*
	T _{nom} :	20°C	
	T _{max} :	☐ 50°C	☐ X°C*
Operating voltage:	V _{min} (85% V _{nom}):	☐ 102V/60Hz	☐ XVdc*
	V _{nom} :	☐ 120V/60Hz	☐ XVdc*
	V _{max} (115% V _{nom}):	☐ 138V/60Hz	☐ XVdc*

*Ask from provider

Antenna Characteristic			
Antenna assembly	Gain (dBi)	Frequency Band (MHz)	Impedance(Ω)
1	-	-	50

Modulation Type
-

Hardware information			
Highest internal frequency (PLL, Quartz, Clock, Microprocessor...):	F _{Highest} :	1600	MHz
Firmware (if applicable):	V:	1.5.5-SNAPSHOT	
Software (if applicable):	V:	-	

NC: Not communicated by provider



2.2. RUNNING MODE

Test mode	Description of test mode
Test mode 1	Permanent emission with modulation on a fixed channel in the data rate that produced the highest power.
Test mode 2	Permanent reception

Test	Running mode
Occupied Bandwidth	Test mode 1
Frequency Tolerance	Test mode 1
AC Power Line Conducted Emission	Test mode 1
Field strength within the band 13.110-14.010MHz	Test mode 1
Field strength outside of the bands 13.110-14.010 MHz	Test mode 1
Receiver Radiated Emissions	Test mode 2 (1)

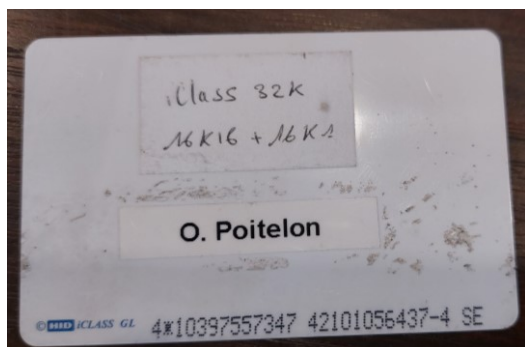
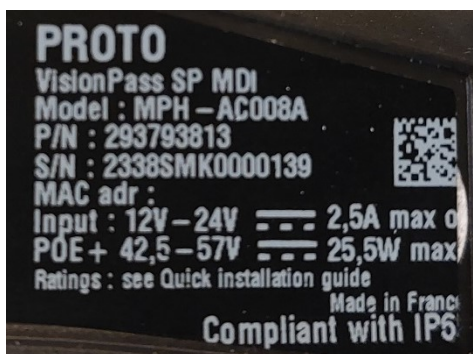
(1) The test can't be performed because the transmitter and receiver are operating at the same frequency and the transmitter cannot be switched off as the carrier is used as receiver injection signal



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2.3. EQUIPMENT LABELLING

Label



2.4. EQUIPMENT MODIFICATIONS DURING THE TESTS

None



2.5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follow:

$$FS = RA + AF + CF - AG$$

Where:

FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Factor

AG = Amplifier Gain

Example:

Assume a receiver reading of 52.5dB μ V is obtained. The antenna factor of 7.4 and a cable factor of 1.1 are added. The amplifier gain of 29dB is subtracted, giving a field strength of 32 dB μ V/m.

$$FS = 52.5 + 7.4 + 1.1 - 29 = 32 \text{ dB}\mu\text{V/m}$$

The 32 dB μ V/m value can be mathematically converted to its corresponding level in μ V/m.

$$\text{Level in } \mu\text{V/m} = \text{Common Antilogarithm } [(32\text{dB}\mu\text{V/m})/20] = 39.8 \mu\text{V/m}.$$

2.6. TEST DISTANCE EXTRAPOLATION – FCC/ISED

The field strength is extrapolated to the new measurement distance using formula from FCC Part15.31 (f) and §6.5-6.6 RSS-GEN:

Below 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 40 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Above 30MHz,

$$FS_{\text{limit}} = FS_{\text{max}} - 20 \log \left(\frac{d_{\text{limit}}}{d_{\text{measure}}} \right)$$

Where:

FS_{limit} is the calculation of field strength at the limit distance, expressed in dB μ V/m

FS_{max} is the measured field strength, expressed in dB μ V/m

d_{measure} is the distance of the measurement point from the EUT

d_{limit} is the reference limit distance

2.7. CALIBRATION DATE

The calibration intervals are extended at 12+2 months. This extended interval is based on the fact that there is sufficient calibration data to statistically establish a trend or based on experience of use of the test equipment to assure good measurement results for a longer period.

3. OCCUPIED BANDWIDTH

3.1. TEST CONDITIONS

Date of test : July 05, 2023
Test performed by : Julien Palard
Atmospheric pressure (hPa) : -
Relative humidity (%) : 41
Ambient temperature (°C) : 26

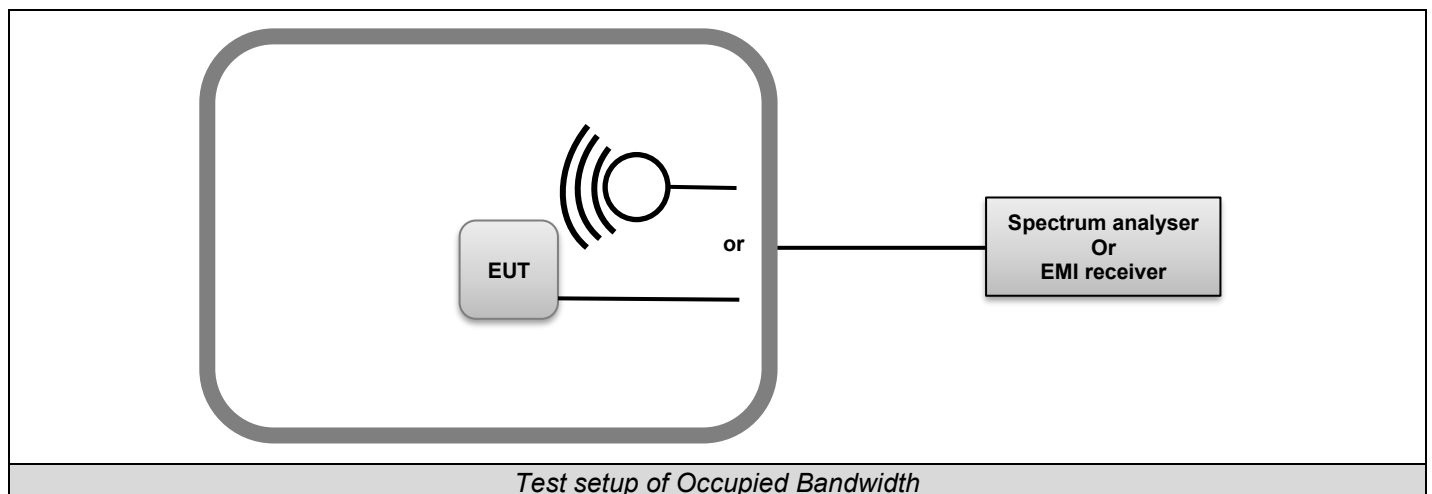
3.2. TEST SETUP

The Equipment Under Test is installed in a climatic chamber.
Measurement is performed with a spectrum analyzer in radiated method.

The EUT is turned ON, the center frequency of the spectrum analyzer is set to the fundamental frequency. The captured power is measured and recorded; the measurement is repeated until all frequencies required were complete.

Test Procedure:

- ☑ RSS-Gen Issue 5 § 6.7
 - RBW used in the range of 1% to 5% of the anticipated emission bandwidth
 - Set the video bandwidth (VBW) $\geq 3 \times$ RBW.
 - Detector = Peak.
 - Trace mode = Max Hold.
 - Sweep = Auto couple.
 - Allow the trace to stabilize.
 - OBW 99% function of spectrum analyzer used



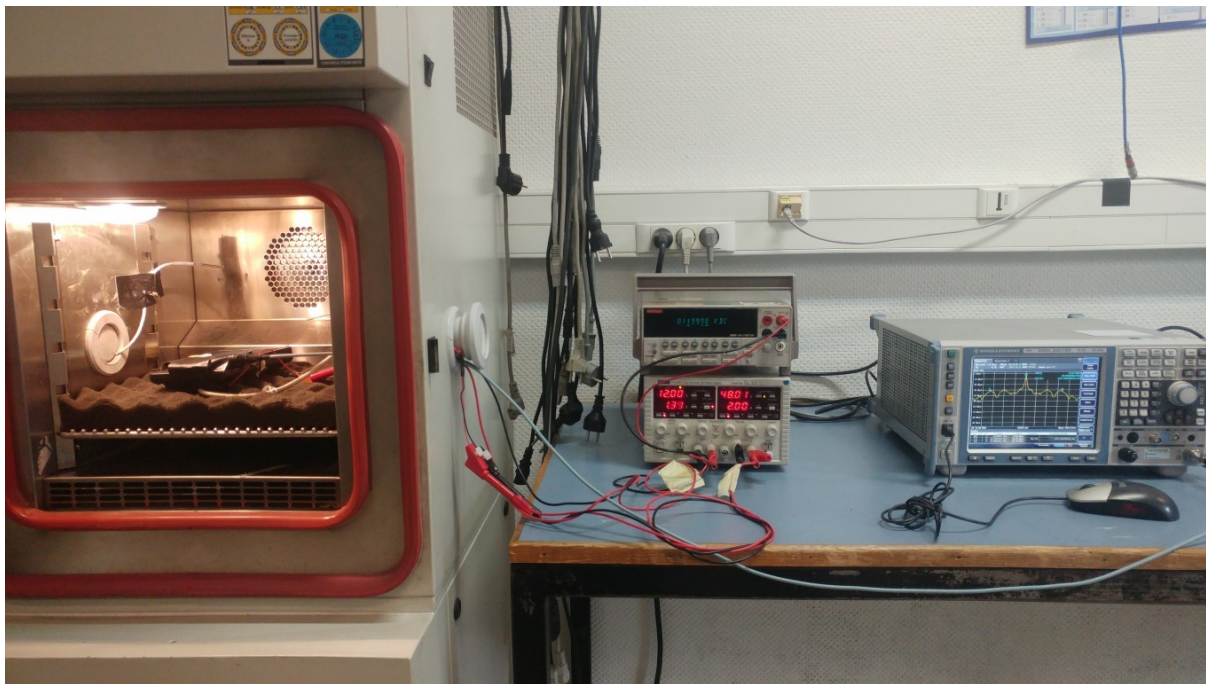


Photo of Occupied bandwidth

3.3. LIMIT

None

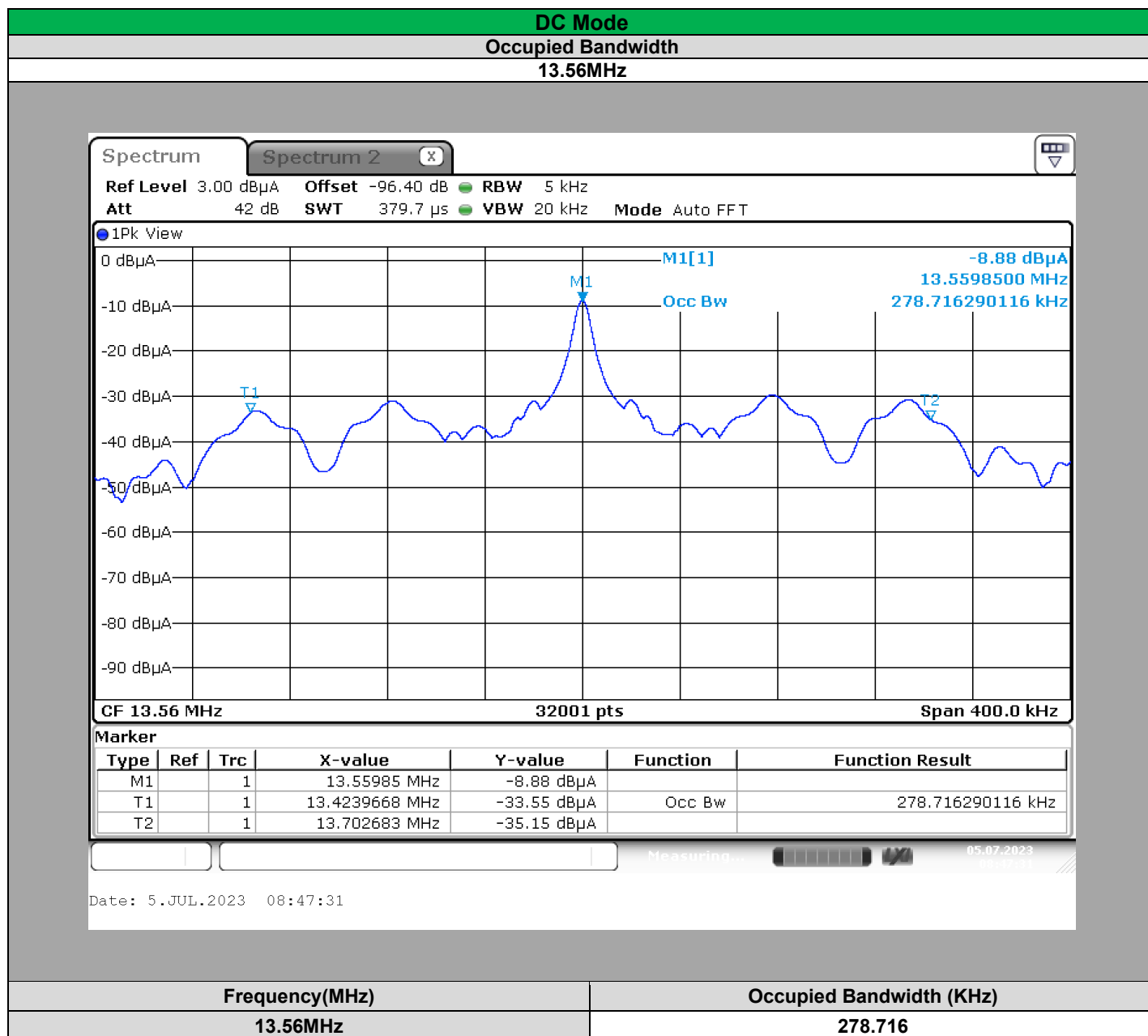
3.4. TEST EQUIPMENT LIST

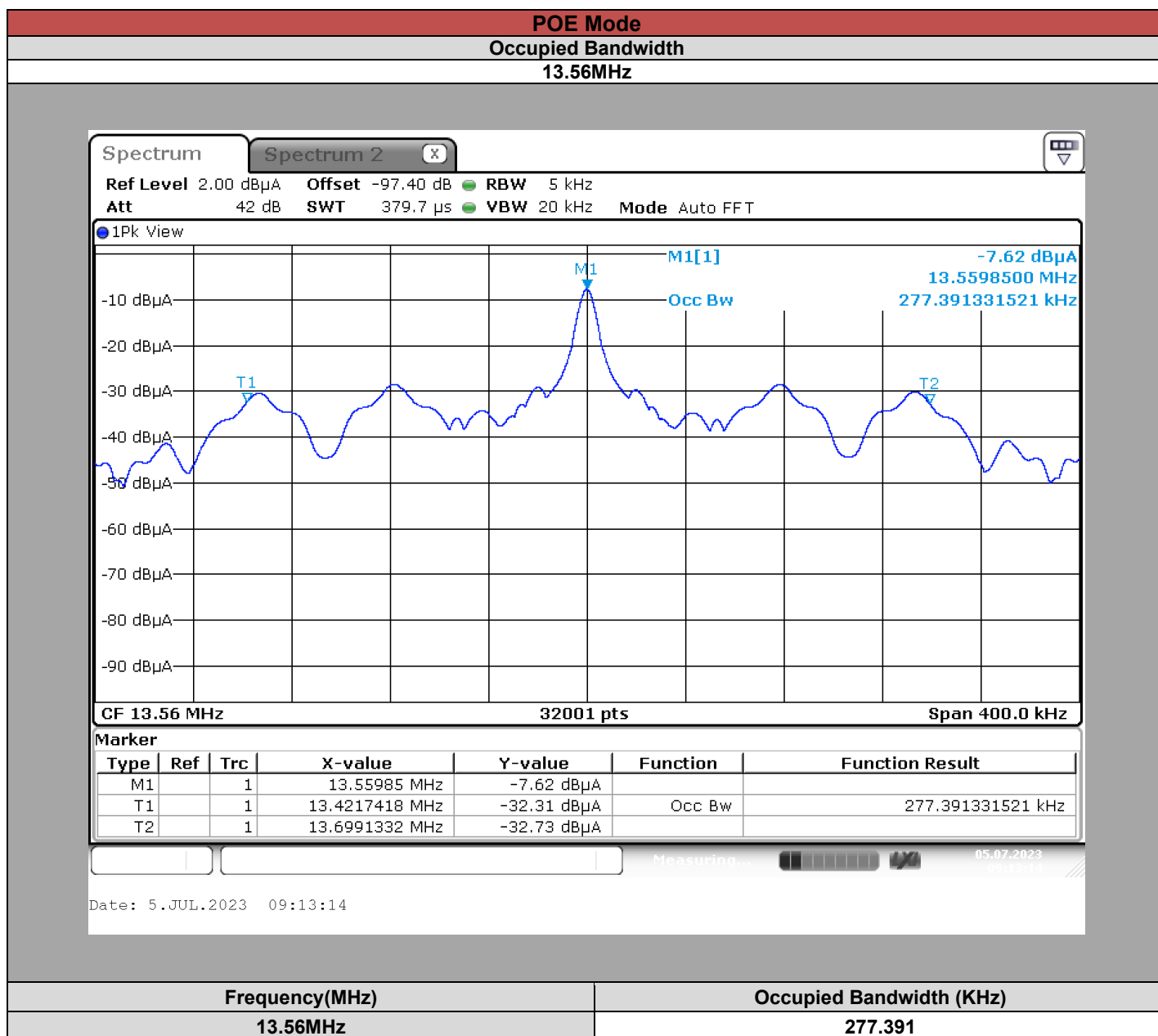
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI	SLT34	D1024029	See Hygrometer	See Hygrometer
Hygrometer	AOIP	TM360	B4041042	2023/04	2025/04
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Multimeter	KEITHLEY	2000	A1242090	2023/03	2025/03
Power supply	TTi	CPX400D	A7042247	See Multimeter	See Multimeter
13,56MHz Test fixture Antenna	-	-	A5329422	-	-

3.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

3.6. RESULTS





Frequency(MHz)
13.56MHz

Occupied Bandwidth (KHz)
277.391

3.7. CONCLUSION

Occupied Channel Bandwidth measurement performed on the sample of the product **MPH-AC008A**, Sn: **2338SMK0000139**, in configuration and description presented in this test report, show levels **compliant** to the **RSS-GEN** limits.

4. 20dB EMISSION BANDWIDTH

4.1. TEST CONDITIONS

Date of test : July 05, 2023
Test performed by : Julien Palard
Atmospheric pressure (hPa) : -
Relative humidity (%) : 41
Ambient temperature (°C) : 26

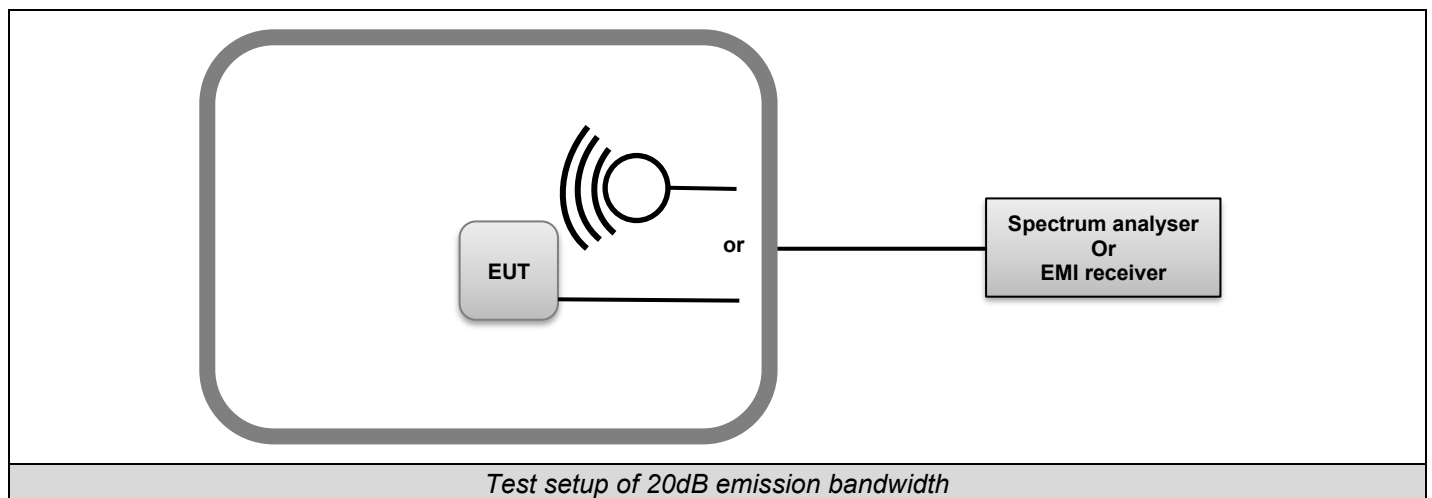
4.2. TEST SETUP

The Equipment Under Test is installed in a climatic chamber.
Measurement is performed with a spectrum analyzer in radiated method.

Test Procedure:

☒ ANSI C63.10 § 6.9.2:

The EUT is turn ON; levels have been corrected to be in compliant with the Peak Output Power measured; and using the MaxHold function, the frequency separation of two frequencies that were attenuated 20dB from the Peak Output Power level. A delta marker is used to measure the frequency difference as the emission bandwidth.



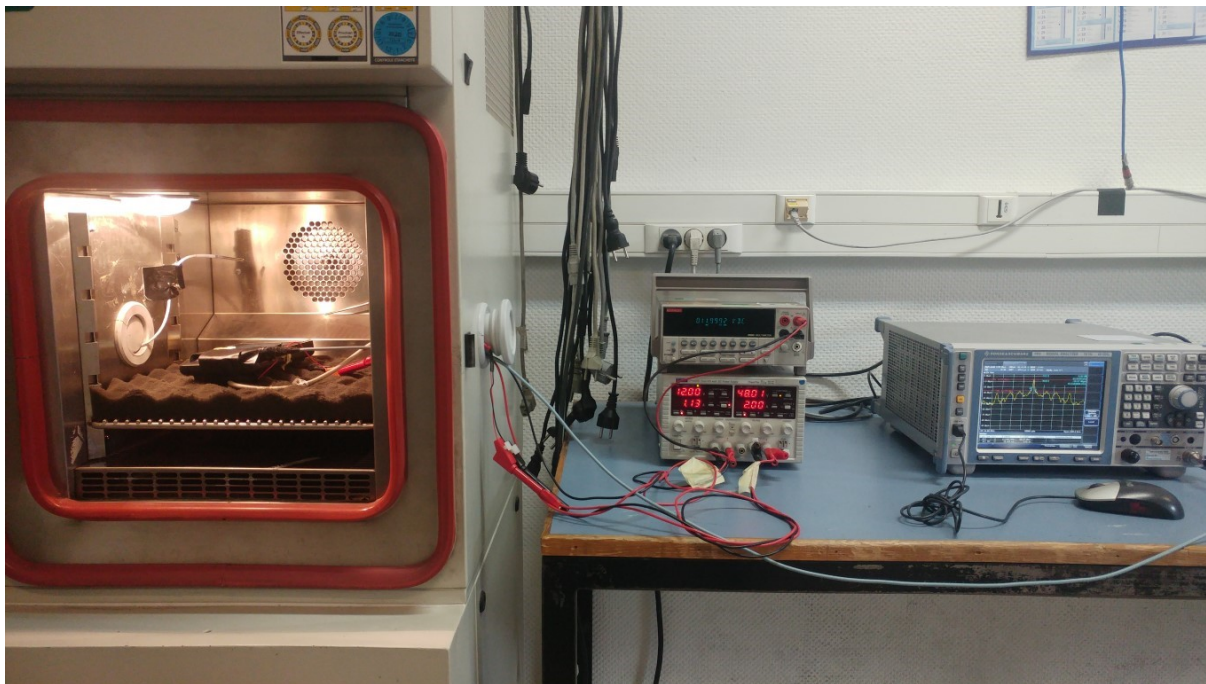


Photo of 20dB emission bandwidth

4.3. LIMIT

No Limit

4.4. TEST EQUIPMENT LIST

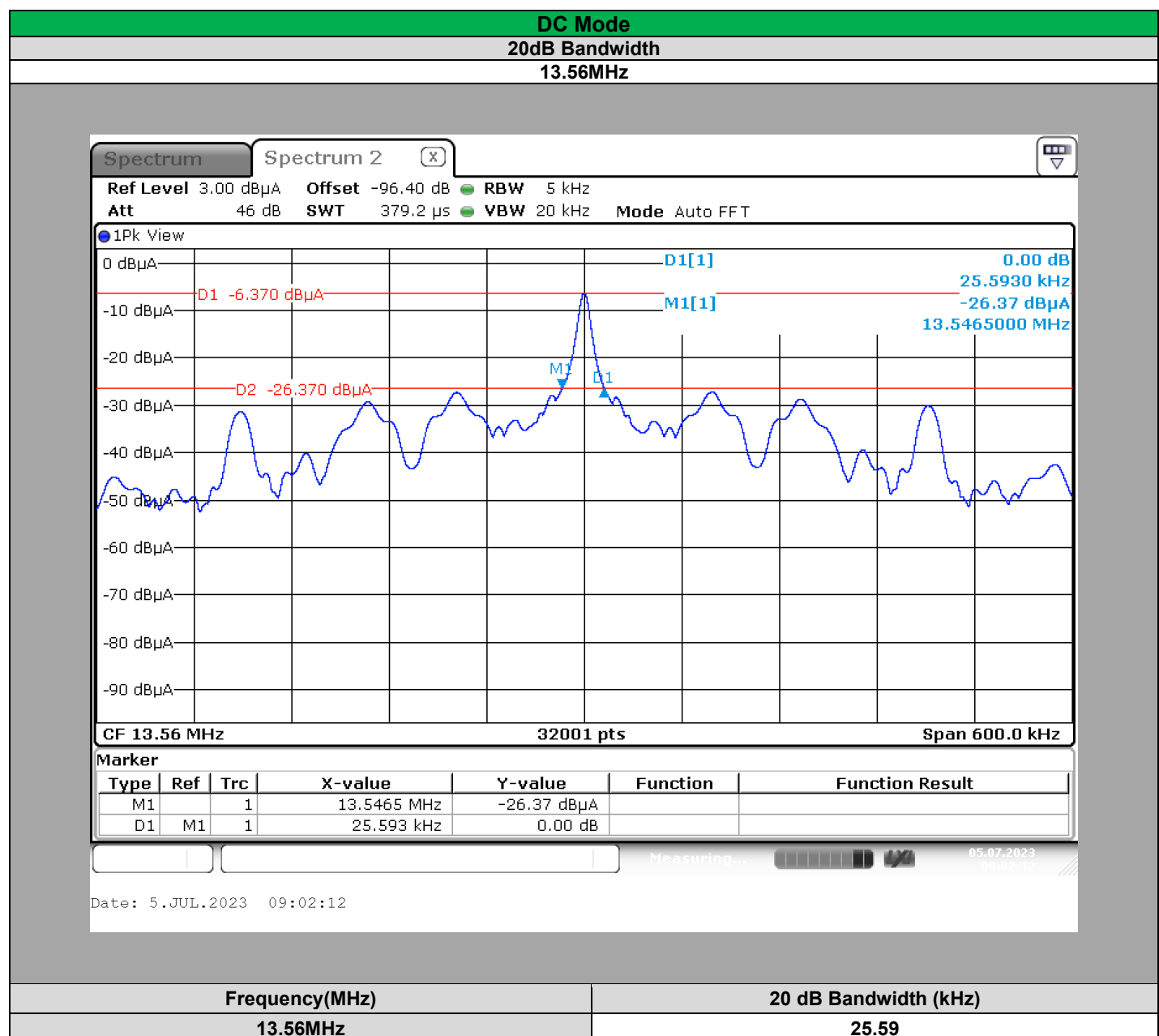
DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI	SLT34	D1024029	See Hygrometer	See Hygrometer
Hygrometer	AOIP	TM360	B4041042	2023/04	2025/04
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Multimeter	KEITHLEY	2000	A1242090	2023/03	2025/03
Power supply	TTi	CPX400D	A7042247	See Multimeter	See Multimeter
13,56MHz Test fixture Antenna	-	-	A5329422	-	-

4.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

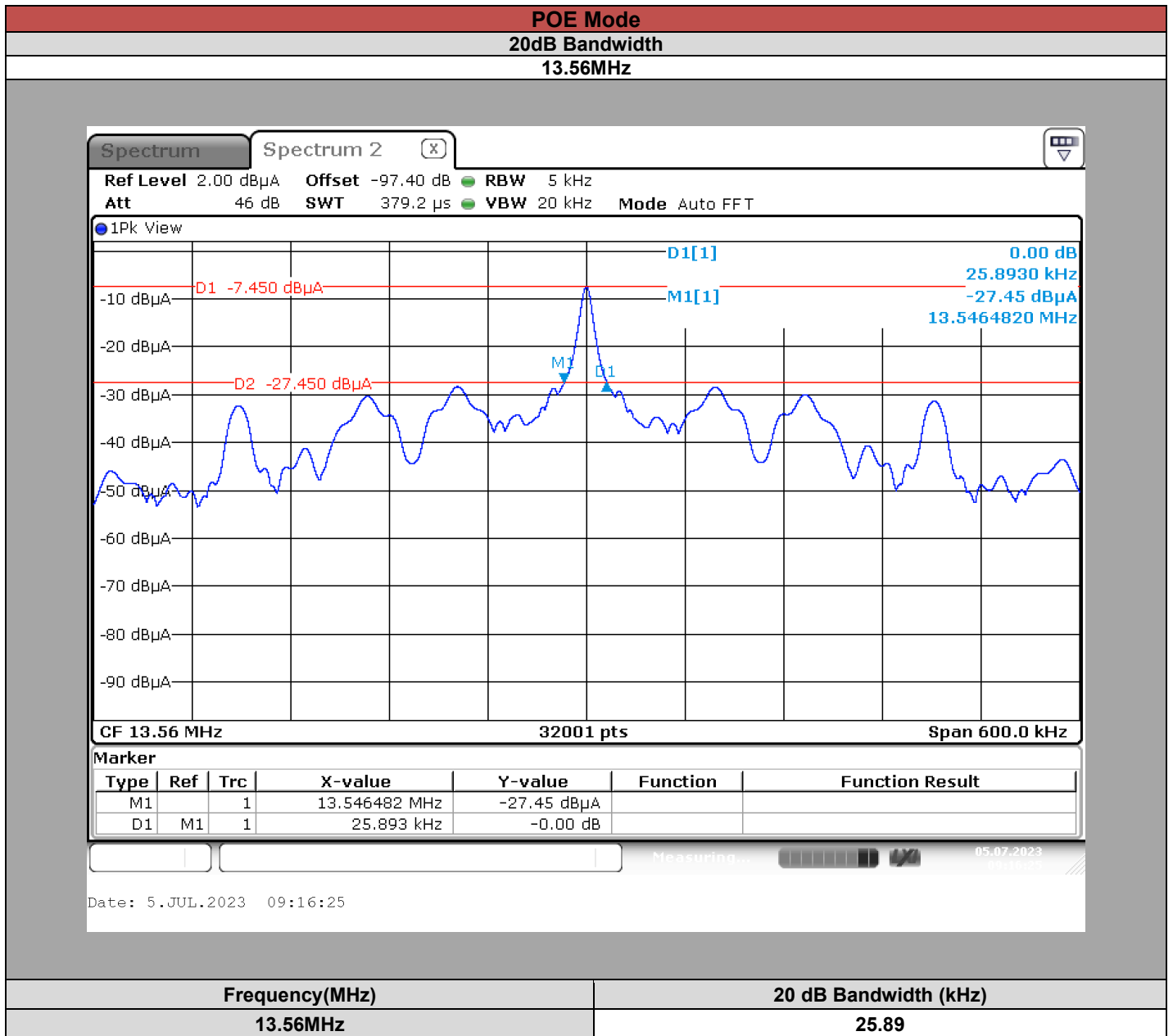


4.6. RESULTS





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4.7. CONCLUSION

20dB Emission Bandwidth measurement performed on the sample of the product **MPH-AC008A**, Sn: **2338SMK0000139**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.225 & RSS 210** limits.

5. FREQUENCY TOLERANCE

5.1. TEST CONDITIONS

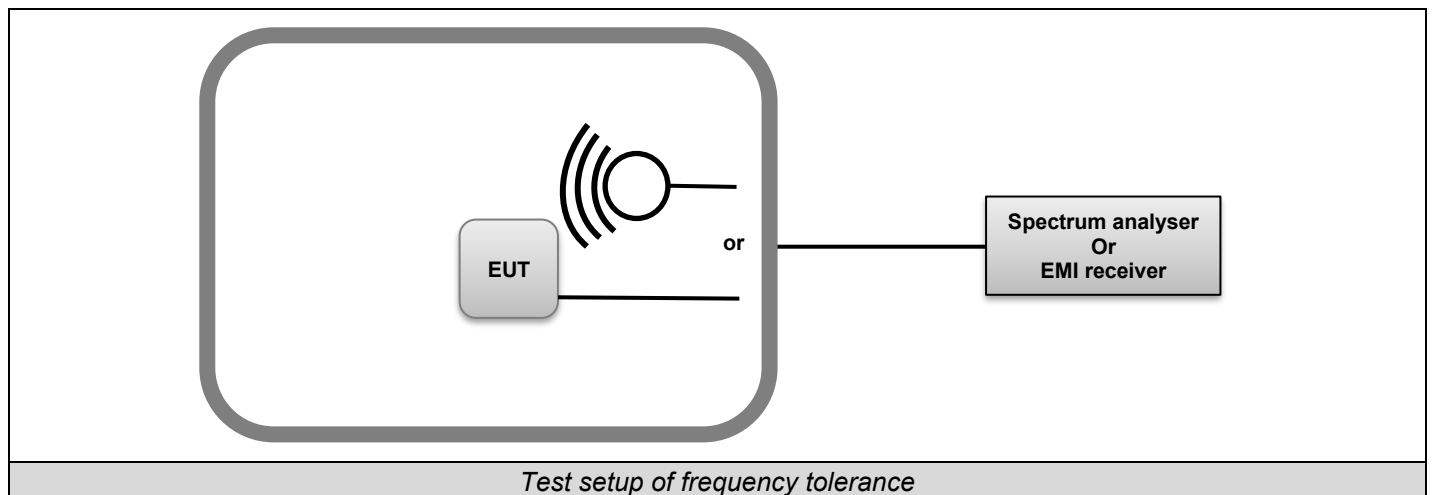
Date of test : July 05, 2023
Test performed by : Julien Palard
Atmospheric pressure (hPa) : -
Relative humidity (%) : 41
Ambient temperature (°C) : 26

5.2. TEST SETUP

The Equipment Under Test is installed in a climatic chamber.
Measurement is performed with a spectrum analyzer in radiated method.

Test Procedure:

☒ ANSI C63.10 § 6.8



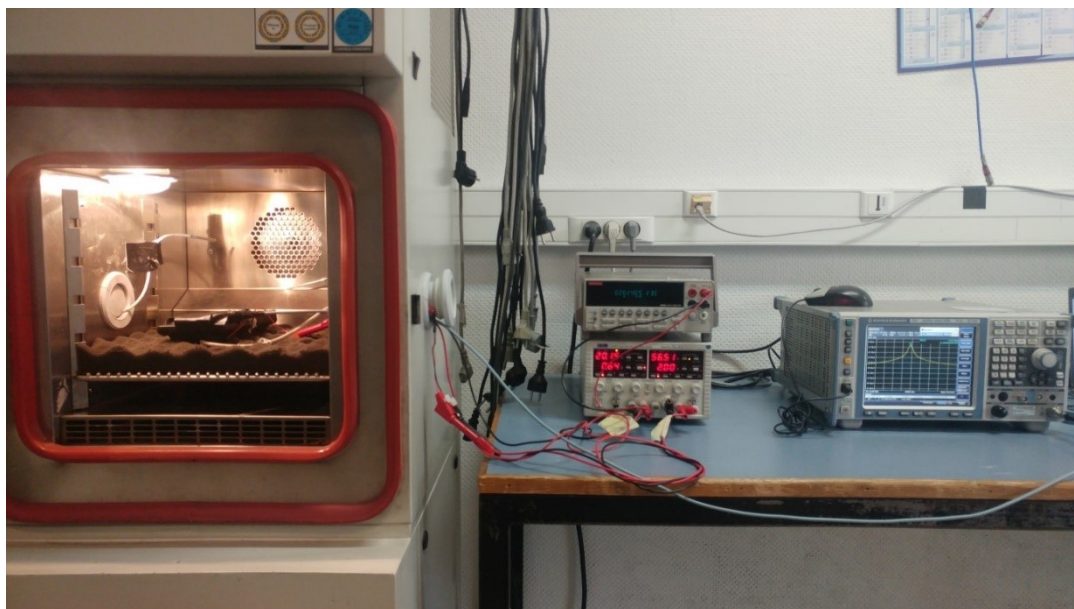


Photo of frequency tolerance in normal test condition

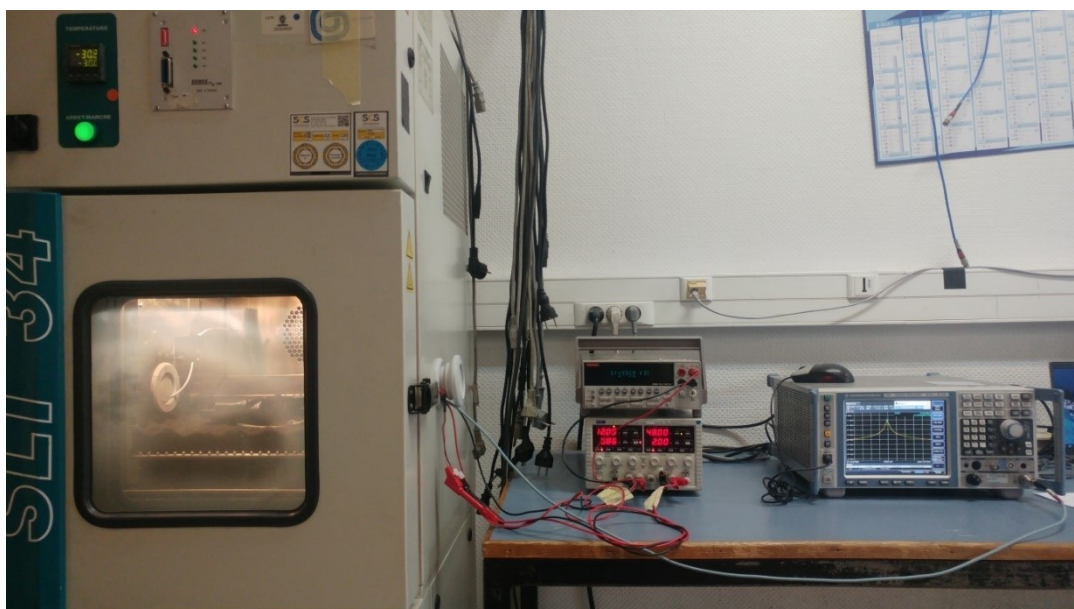


Photo of frequency tolerance in extreme test condition



5.3. LIMIT

$\pm 0.01\%$ ($\pm 100\text{ppm}$)

5.4. TEST EQUIPMENT LIST

DESCRIPTION	MANUFACTURER	MODEL	N° LCIE	Cal_Date	Cal_Due
Climatic chamber	SECASI	SLT34	D1024029	See Hygrometer	See Hygrometer
Hygrometer	AOIP	TM360	B4041042	2023/04	2025/04
EMI receiver	ROHDE & SCHWARZ	FSV40GHz	A4060061	2022/02	2024/02
Multimeter	KEITHLEY	2000	A1242090	2023/03	2025/03
Power supply	TTi	CPX400D	A7042247	See Multimeter	See Multimeter
13,56MHz Test fixture Antenna	-	-	A5329422	-	-

5.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

5.6. RESULTS

Frequency (MHz)	13,56	DC Mode							
EUT ACTIVATION	Start up								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,5599	13,55988	13,55984	13,55981	13,55981	13,55983	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0009	-0,0012	-0,0014	-0,0014	-0,0013	-0,0013	-0,0015
EUT ACTIVATION	2min								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,5599	13,55988	13,55984	13,55981	13,55981	13,55983	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0009	-0,0012	-0,0014	-0,0014	-0,0013	-0,0013	-0,0015
EUT ACTIVATION	5min								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,5599	13,55988	13,55984	13,55981	13,55981	13,55983	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0009	-0,0012	-0,0014	-0,0014	-0,0013	-0,0013	-0,0015
EUT ACTIVATION	10min								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,5599	13,55988	13,55984	13,55981	13,55981	13,55983	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0009	-0,0012	-0,0014	-0,0014	-0,0013	-0,0013	-0,0015

Temperature	Tnom		
Voltage	Vmin	Vnom	Vmax
Frequency (MHz)	13,55982	13,55982	13,55982
Frequency Drift (%)	-0,0013	-0,0013	-0,0013



Frequency (MHz)	13,56	POE Mode							
EUT ACTIVATION	Start up								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,55991	13,55987	13,55985	13,55982	13,55981	13,55982	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0010	-0,0011	-0,0013	-0,0014	-0,0013	-0,0013	-0,0015
EUT ACTIVATION	2min								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,55991	13,55987	13,55985	13,55982	13,55981	13,55982	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0010	-0,0011	-0,0013	-0,0014	-0,0013	-0,0013	-0,0015
EUT ACTIVATION	5min								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,5599	13,55987	13,55985	13,55982	13,55981	13,55982	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0010	-0,0011	-0,0013	-0,0014	-0,0013	-0,0013	-0,0015
EUT ACTIVATION	10min								
Voltage	Vnom								
Temperature	-30	-20	-10	0	10	20	30	40	50
Frequency (MHz)	13,55991	13,5599	13,55987	13,55985	13,55982	13,55981	13,55982	13,55982	13,5598
Frequency Drift (%)	-0,0007	-0,0007	-0,0010	-0,0011	-0,0013	-0,0014	-0,0013	-0,0013	-0,0015

Temperature	Tnom		
Voltage	Vmin	Vnom	Vmax
Frequency (MHz)	13,55982	13,55982	13,55982
Frequency Drift (%)	-0,0013	-0,0013	-0,0013

5.7. CONCLUSION

Frequency tolerance measurement performed on the sample of the product **MPH-AC008A**, Sn: **2338SMK0000139**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.225 & RSS 210** limits.

6. AC POWER LINE CONDUCTED EMISSIONS

6.1. TEST CONDITIONS

Date of test : June 22, 2023
 Test performed by : Laurent Deneux
 Atmospheric pressure (hPa) : -
 Relative humidity (%) : 23
 Ambient temperature (°C) : 37

6.2. TEST SETUP

Test procedure:

☒ ANSI C63.10 & FCC Part 15 subpart C

The EUT and auxiliaries are set 80cm above the ground on the non-conducting table (Table-top equipment) at 80cm from the LISN, the cable has been shorted to 1meter length. The distance between the EUT and the vertical ground plane is 40cm. Measurement is made with a receiver in peak mode. This was followed by a Quasi-Peak, i.e. CISPR measurement for any strong signal. If the average limit is met when using a Quasi-Peak detector, the EUT shall be deemed to meet both limits and measurement with the average detector is unnecessary. Interconnecting cables and equipment's were moved to position that maximized emission. The EUT is powered like specified in following table, through a LISN (measure); auxiliaries are powered by another LISN.

Type	Measurement performed:	
☒ AC / ☐ DC (Auxiliary used)	☒ 120VAC/60Hz	☒ 240VAC/50Hz
☐ USB (Laptop auxiliary)	☐ 120VAC/60Hz (Laptop auxiliary)	☐ 240VAC/50Hz (Laptop auxiliary)

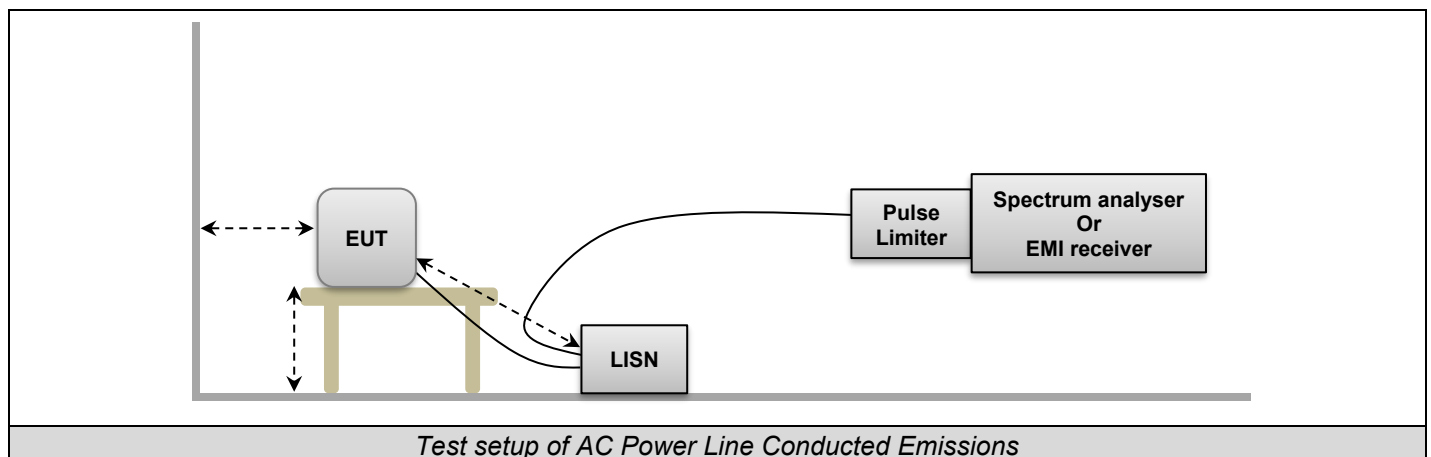




Photo of AC Power Line Conducted Emissions

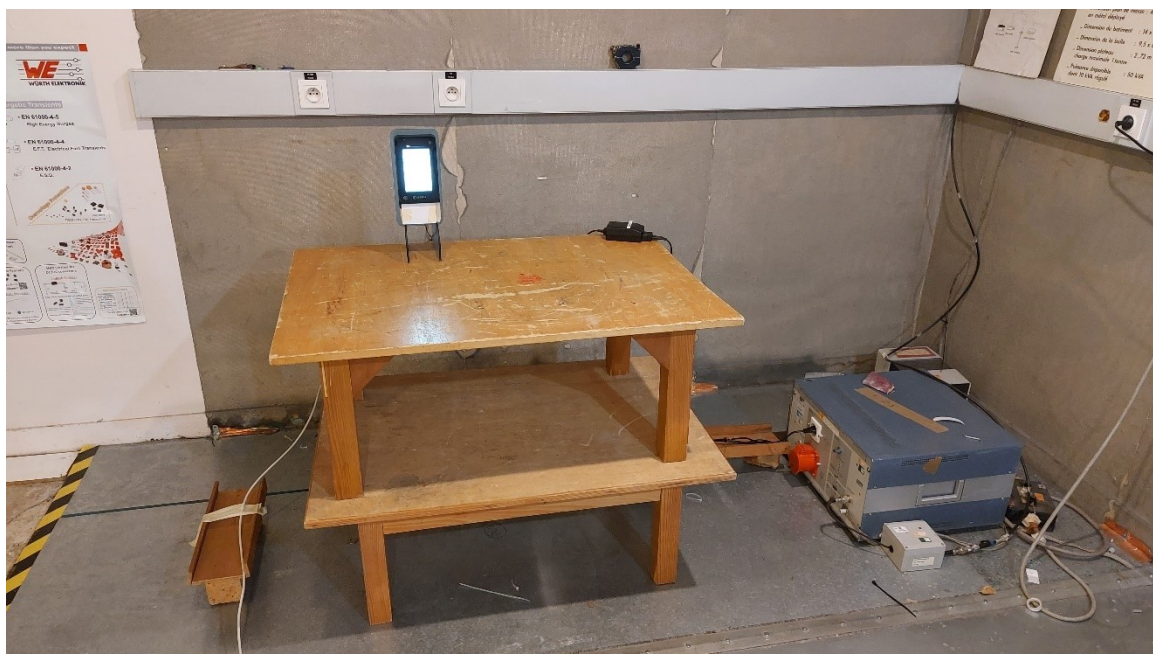


Photo of AC Power Line Conducted Emissions



6.3. LIMIT

Frequency range	Level	Detector
0,15kHz to 0,5MHz	66dB μ V to 56 μ V*	QPeak
	56dB μ V to 46 μ V*	Average
0,5MHz to 5MHz	56dB μ V	QPeak
	46dB μ V	Average
5MHz to 30MHz	60B μ V	QPeak
	50dB μ V	Average

*Decreases with the logarithm of the frequency

6.4. TEST EQUIPMENT LIST

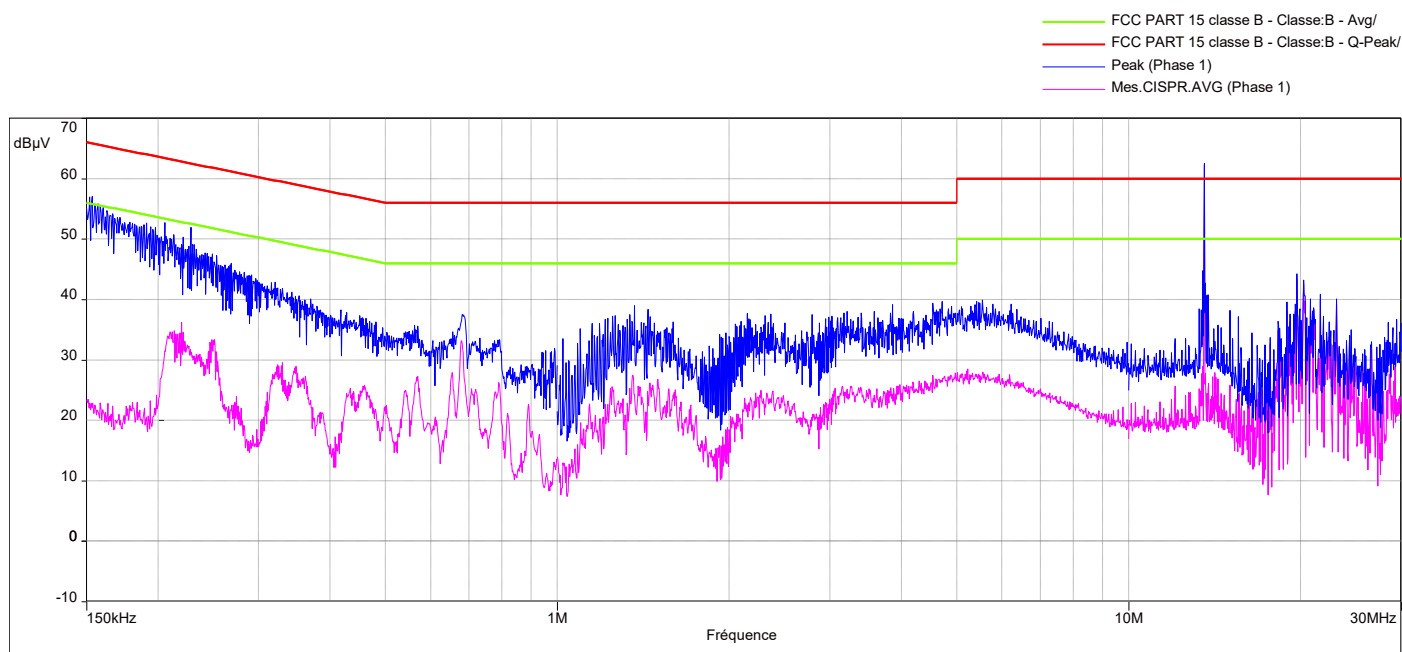
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Receiver	ROHDE & SCHWARZ	ESU	A2642018	2023/03	2025/03
Limiter	ROHDE & SCHWARZ	ESH3-Z2	A2649008	2022/06	2024/06
Network V / V ISLN	ROHDE & SCHWARZ	ESH2-Z5	C2322002	2022/10	2023/11
Cable	LCIE	-	A5329589	2021/11	2023/11
Cable	-	-	A5329417	2022/11	2023/11
Probe capacitive voltage	SCHAFFNER	CVP2200	A5329031	2022/09	2024/09
Current probe	STODDART	91550-1	A1092006	2022/05	2024/05
Power supply	DANA	DSC5000	A7044076	-	-
Software V3.19.1.21	NEXIO	BAT-EMC	-	-	-

6.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

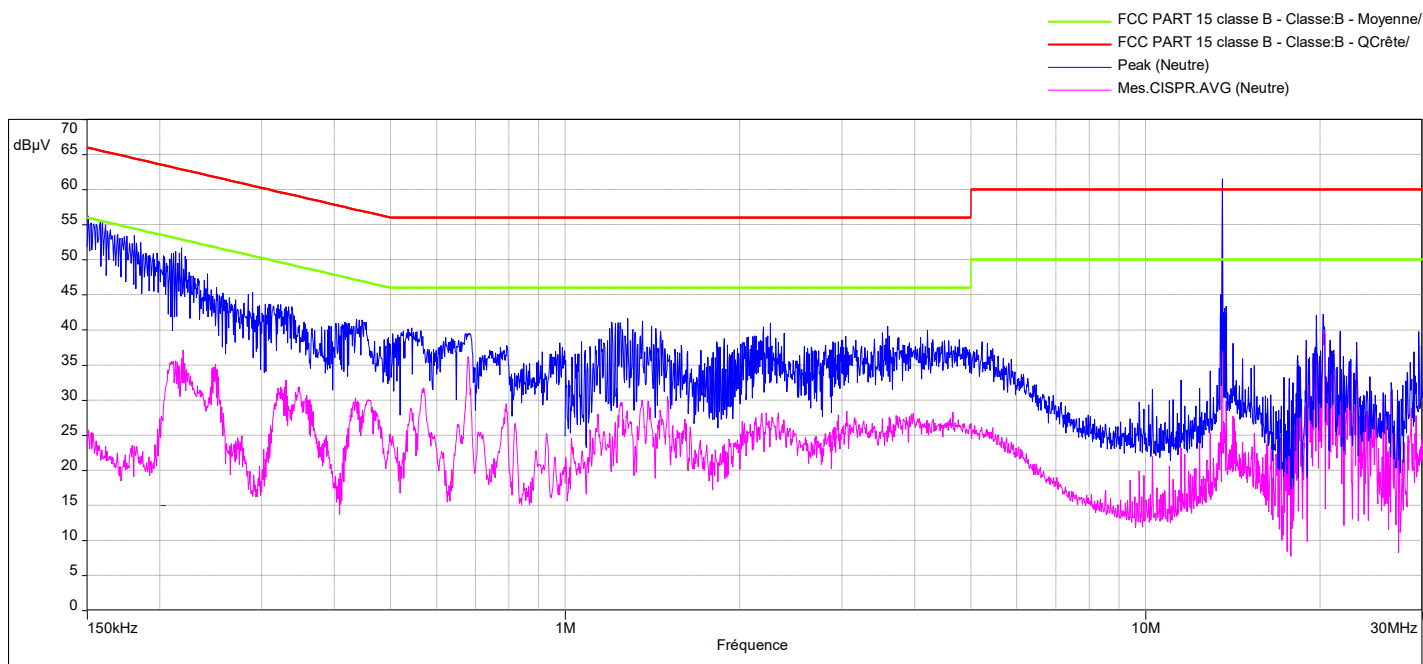
6.6. TEST RESULTS

Diagram N°1
Mode DC – 240V-50Hz
Phase (with antenna)



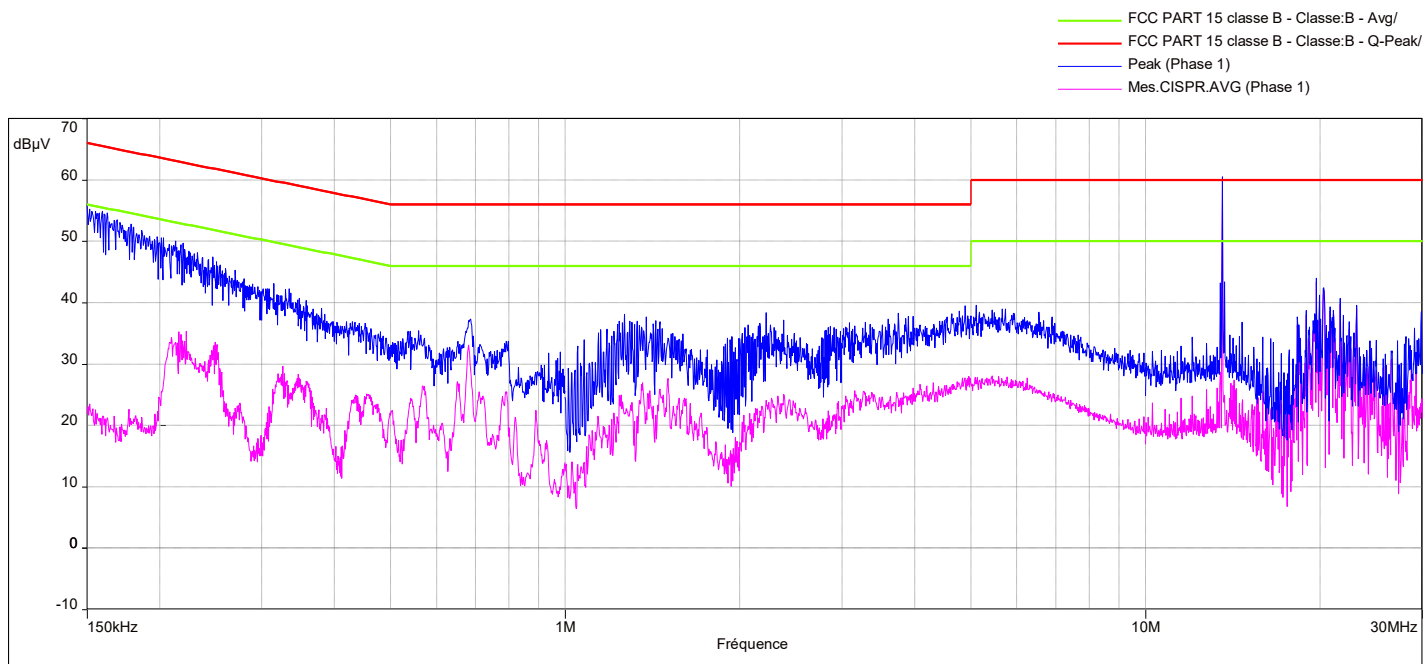
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.22	49.1	-	62.8	13.7	36.2	52.8	16.6
0.68	36.5	-	56	19.5	33.12	46	12.88
1.36	38.9	-	56	17.1	27.35	46	18.65
13.56	62.5	-	60	-2.5	62.1	50	-12.1
19.7	44.24	-	60	15.76	43.4	50	6.6

Diagram N°2
Mode DC – 240V-50Hz
Neutral (with antenna)



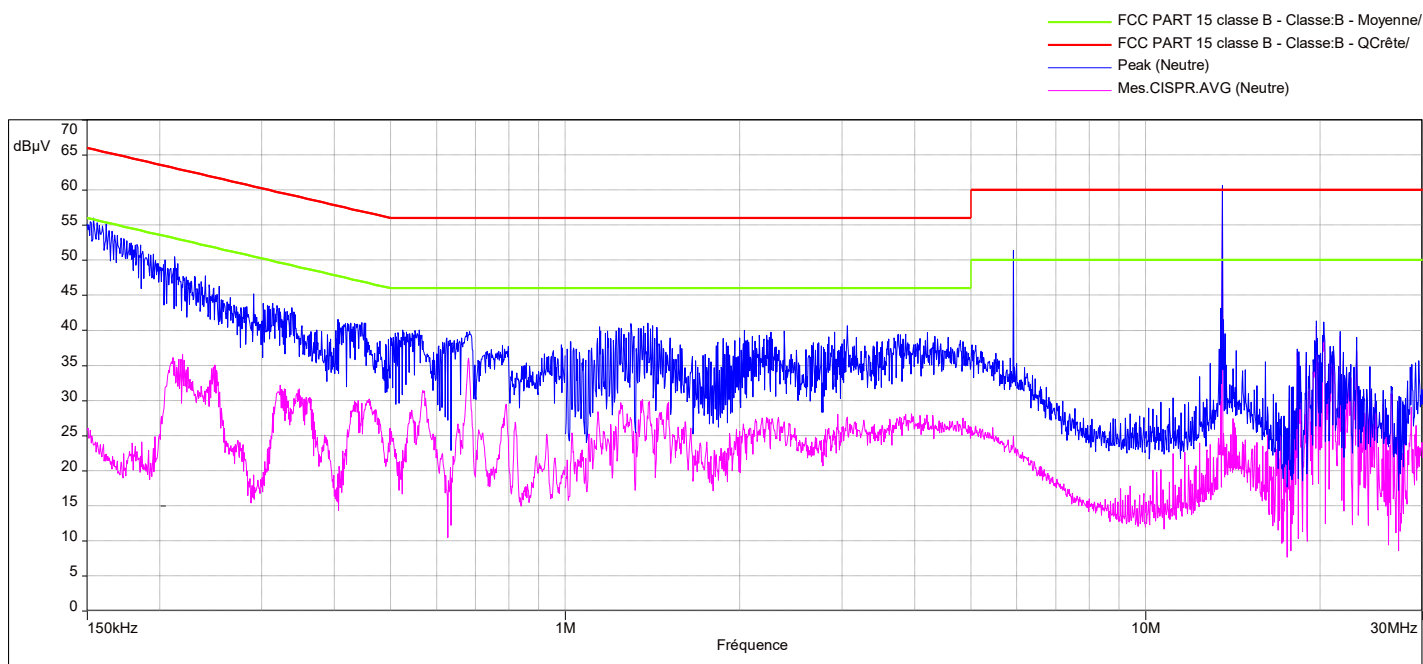
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.22	51.7	-	62.8	11.1	37.09	52.8	15.71
0.68	39.3	-	56	16.7	36.2	46	9.8
1.35	41.3	-	56	14.7	30	46	16
13.56	61.5	-	60	-1.5	61	50	-11
20.25	42.2	-	60	17.8	41.8	50	8.2

Diagram N°3
 Mode DC – 120V-60Hz
 Phase (with antenna)



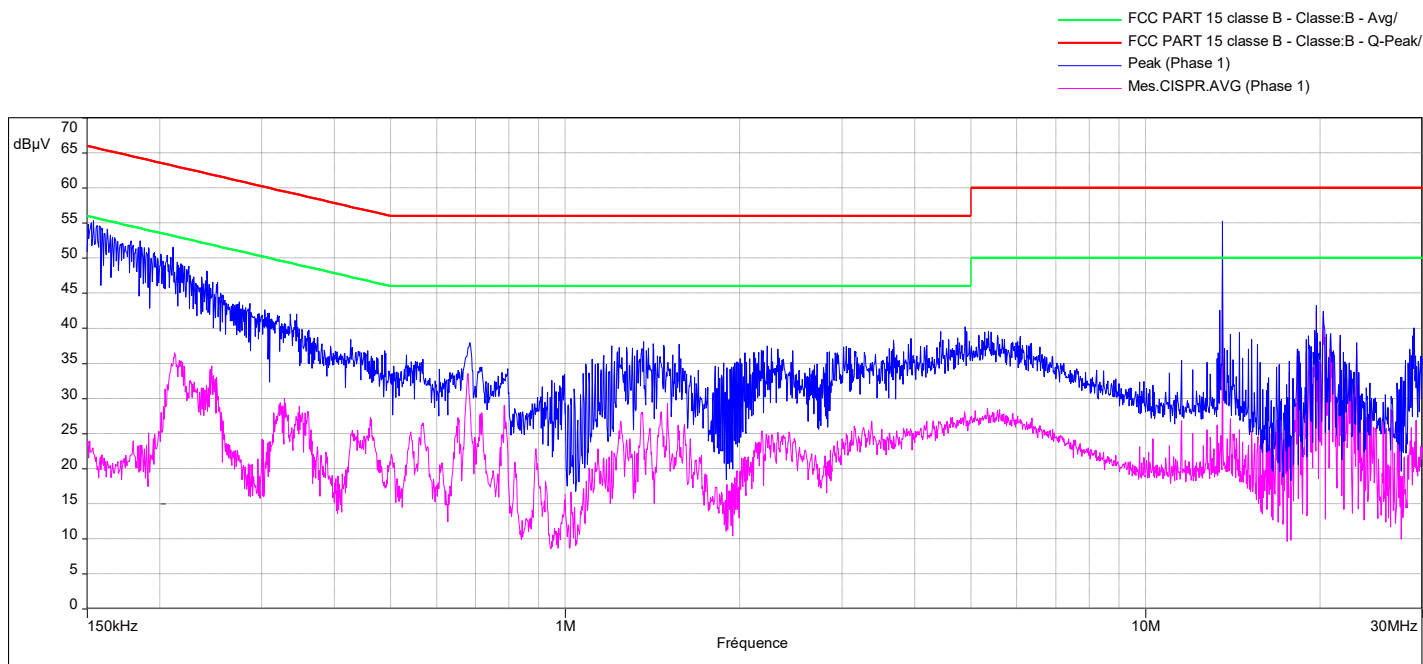
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.22	47.25	-	62.8	15.55	35.6	52.8	17.2
0.68	36.4	-	56	19.6	33.14	46	12.86
1.35	35.7	-	56	20.3	26.96	46	19.04
13.56	60.5	-	60	-0.5	60.15	50	-10.15
20.25	42.3	-	60	17.7	41	50	9

Diagram N°4
Mode DC – 120V-60Hz with antenna
Phase (with antenna)



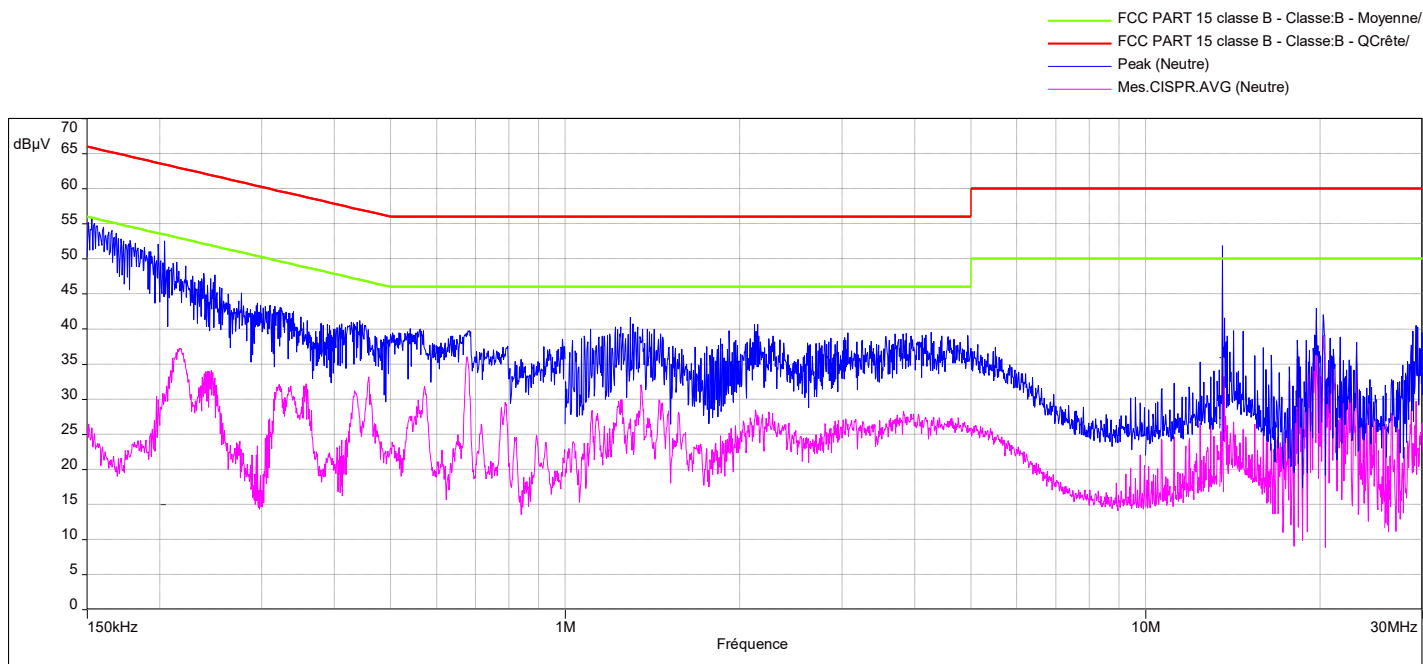
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.22	46	-	62.8	16.8	36.5	52.8	16.3
0.68	39.4	-	56	16.6	35.8	46	10.2
1.35	40.3	-	56	15.7	29.8	46	16.2
13.56	59.8	-	60	0.2	59.15	50	-9.15
19.7	41.2	-	60	18.8	19.7	50	30.3

Diagram N°5
Mode DC – 240V-50Hz without antenna
Phase (without antenna)



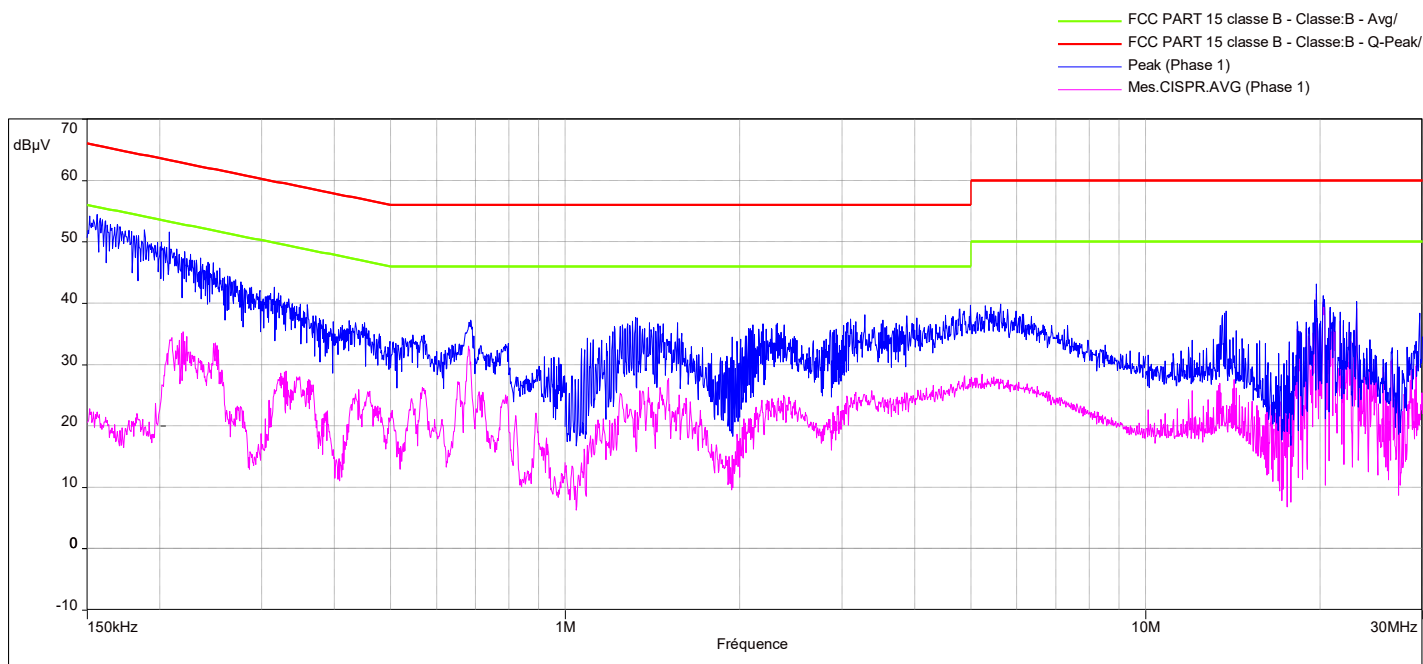
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.216	51.5	-	63	34.8	34.7	53	18.3
0.678	37.8	-	56	18.2	33.2	46	12.8
1.35	37	-	56	19	27.8	46	18.2
13.56	55.3	-	60	4.7	45.9	50	4.1
20.25	42.4	-	60	17.6	41.8	50	8.2

Diagram N°6
Mode DC – 240V-50Hz
Neutral (without antenna)



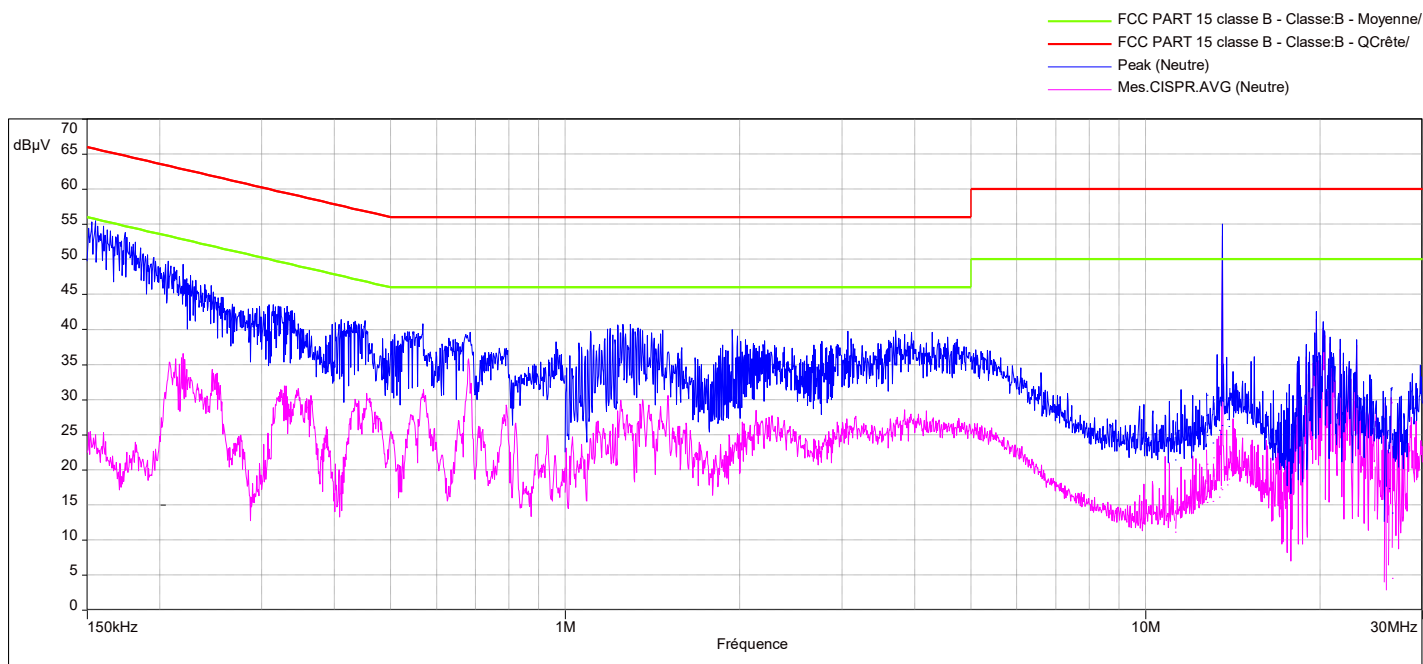
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.216	46.2	-	63	16.8	37.2	53	15.8
0.677	38.7	-	56	17.3	36	46	10
1.35	38	-	56	18	32	46	14
13.56	50.2	-	60	9.8	44.1	50	5.9
19.7	43	-	60	17	41.3	50	8.7

Diagram N°7
Mode DC – 120V-60Hz
Phase(without antenna)



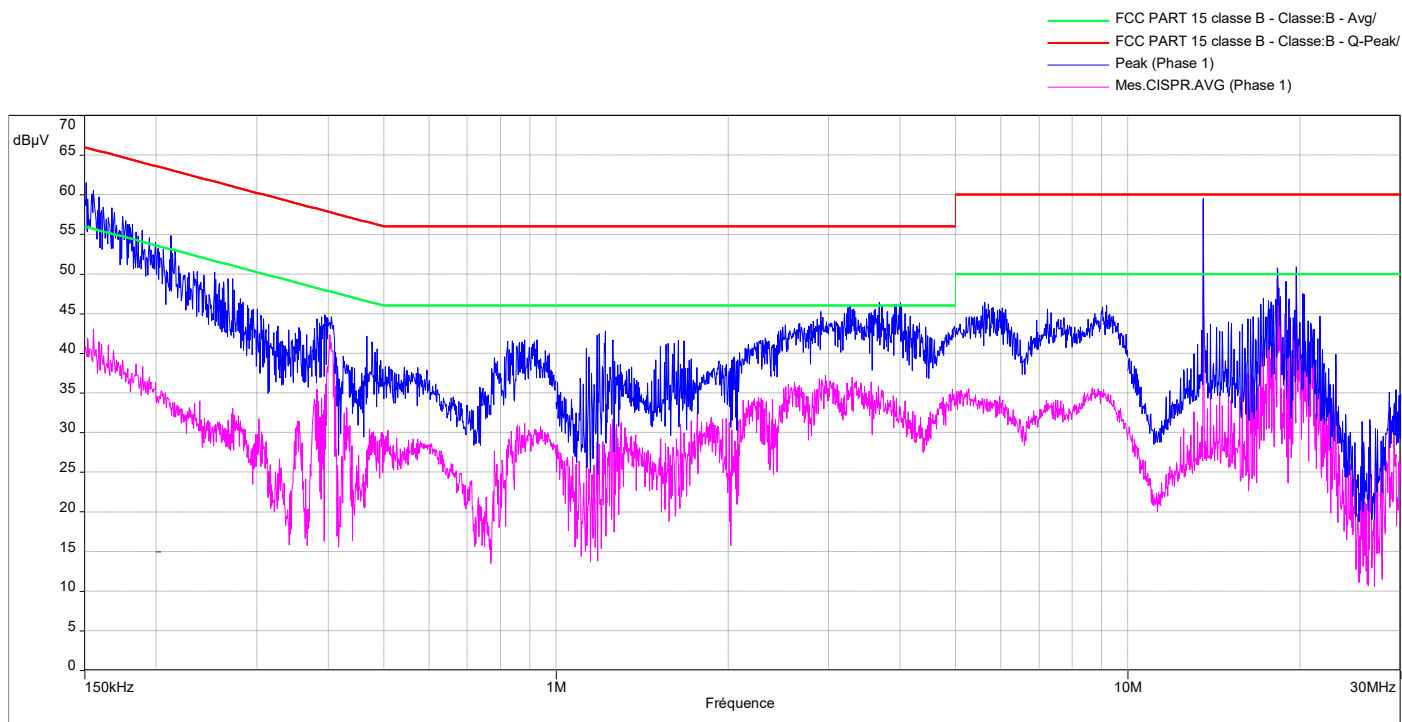
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.22	47.3	-	62.8	15.5	35.3	52.8	17.5
0.682	35.5	-	56	20.5	33	46	13
1.5	33.6	-	56	22.4	27.4	46	18.6
13.44	36.3	-	60	23.7	26.9	50	23.1
20.25	41.3	-	60	18.7	40.15	50	9.85

Diagram N°8
Mode DC – 120V-60Hz
Phase (without antenna)



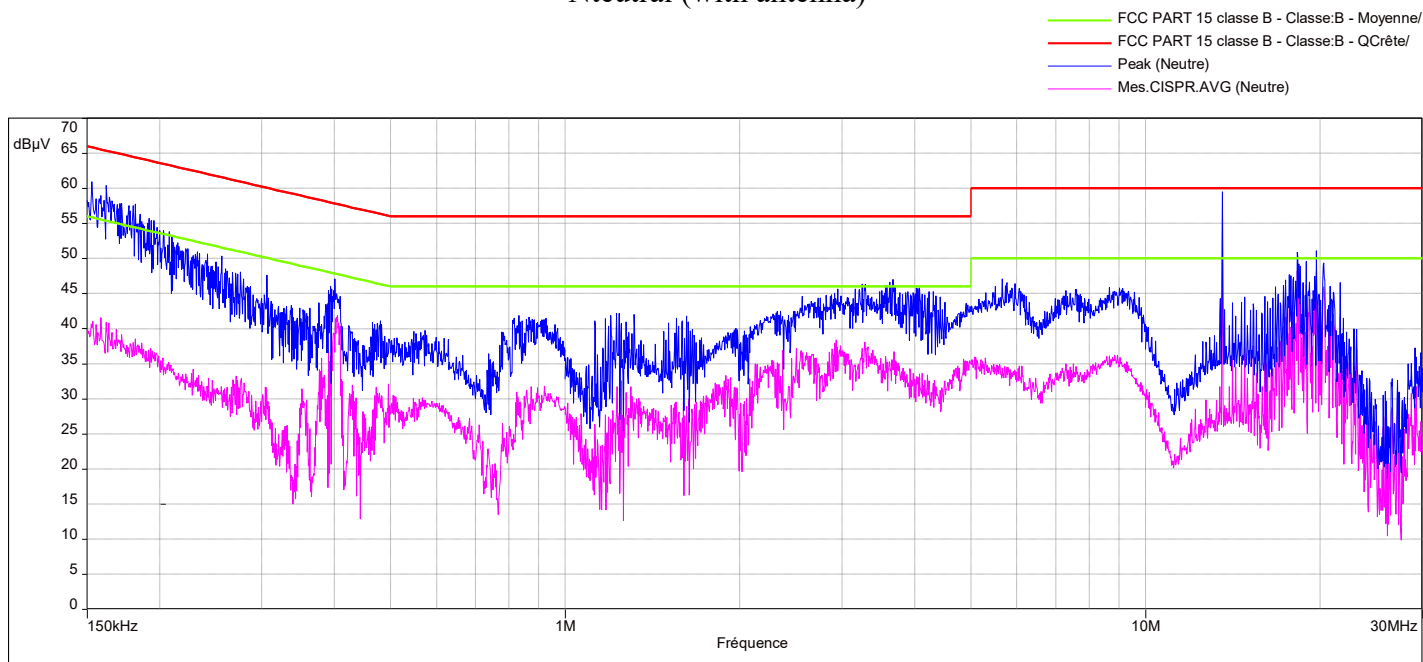
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.22	47.3	-	62.8	15.5	35.3	52.8	17.5
0.682	35.5	-	56	20.5	33	46	13
1.5	33.6	-	56	22.4	27.4	46	18.6
13.44	36.3	-	60	23.7	26.9	50	23.1
20.25	41.3	-	60	18.7	40.15	50	9.85

Diagram N°9
 Mode POE – 240V-50Hz
 Phase (with antenna)



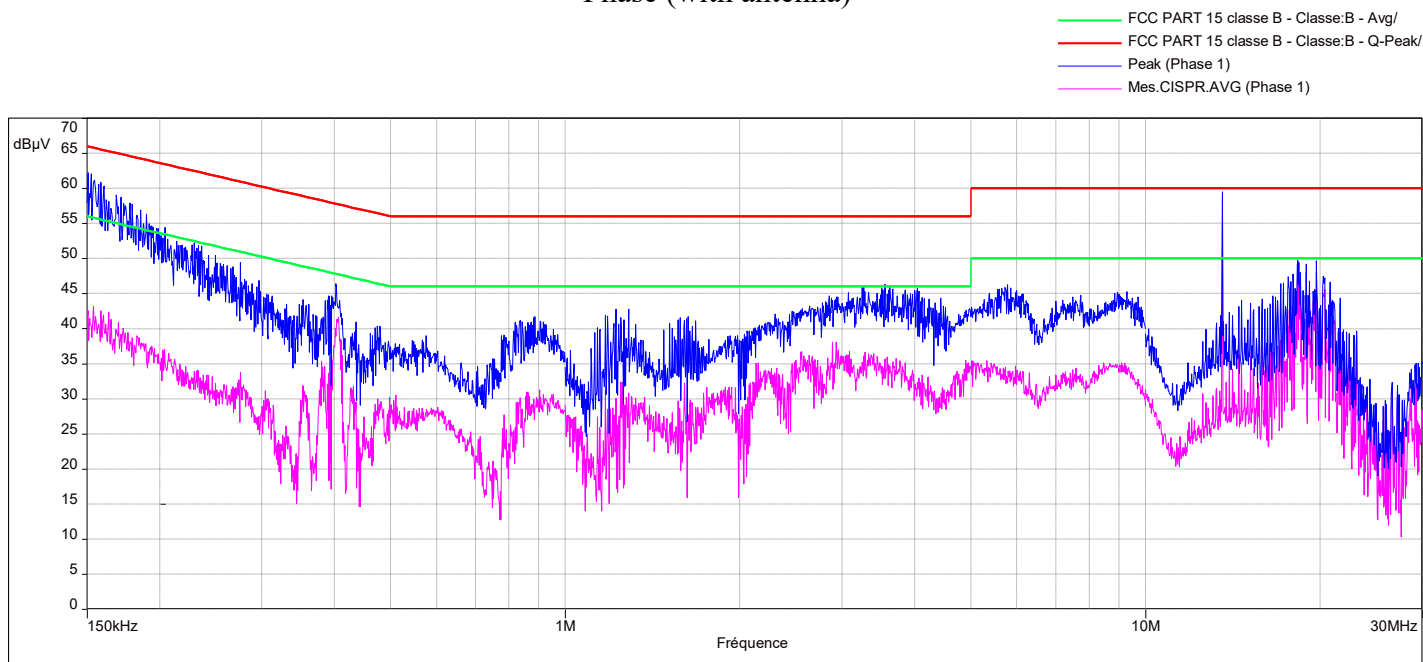
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	59.4	-	66	34.8	40.3	56	15.7
0.406	43.2	-	57.8	14.6	42.3	47.8	5.5
3.29	45.5	-	56	10.5	36.9	46	9.1
13.56	59.5	-	60	0.5	59.2	50	-9.2
19.71	50.9	-	60	9.1	50	50	0

Diagram N°10
 Mode POE – 240V-50Hz
 Nneutral (with antenna)



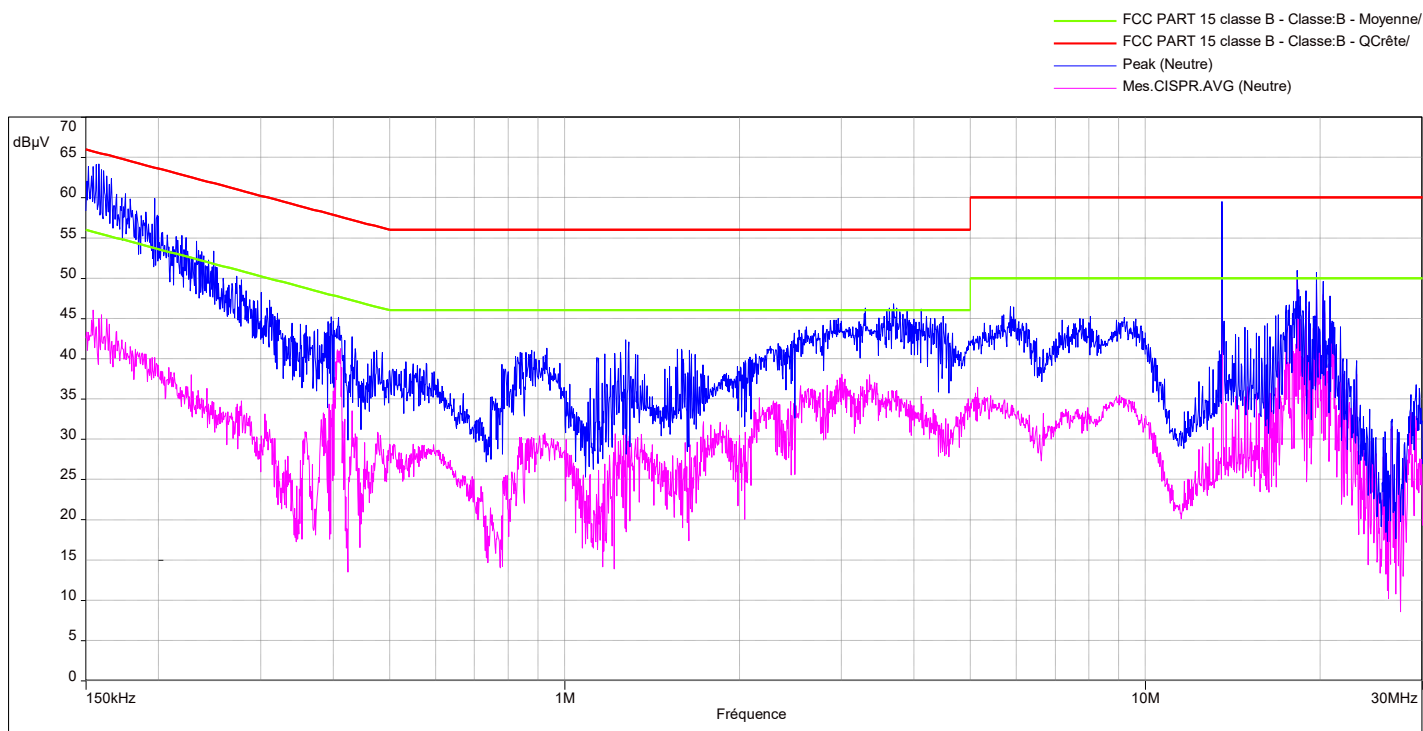
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	58	-	63	34.8	41	53	12
0.406	44.7	-	56	11.3	40.9	46	5.1
1.25	40.7	-	56	15.3	32.6	46	13.4
13.56	58.6	-	60	1.4	58.2	50	-8.2
18.24	50.8	-	60	9.2	48.2	50	1.8

Diagram N°11
 Mode POE – 120V-60Hz
 Phase (with antenna)



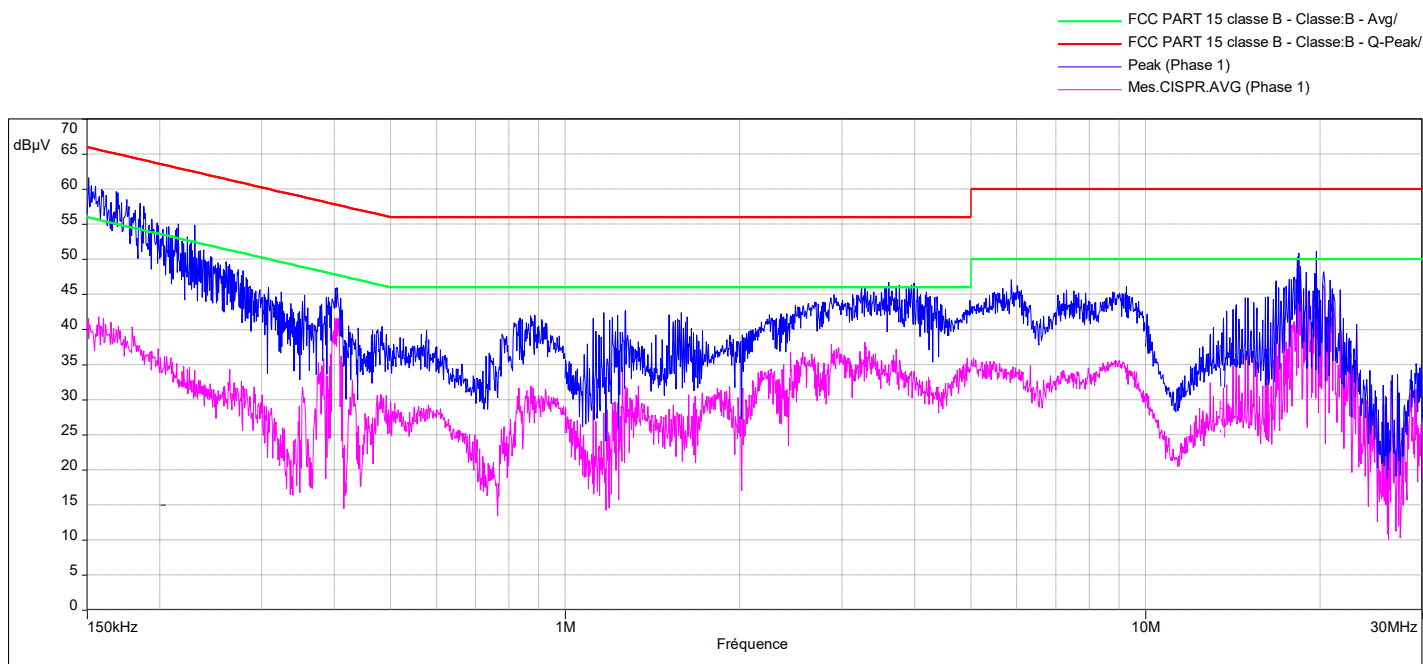
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	60.8	-	66	34.8	43.2	56	12.8
0.406	45.8	-	57.8	12	40.4	47.8	7.4
1.24	41.6	-	56	14.4	32.38	46	13.62
13.56	59.48	-	60	0.52	58.9	50	-8.9
19.7	49.1	-	60	10.9	48.1	50	1.9

Diagram N°12
 Mode POE – 120V-60Hz
 Neutral (with antenna)



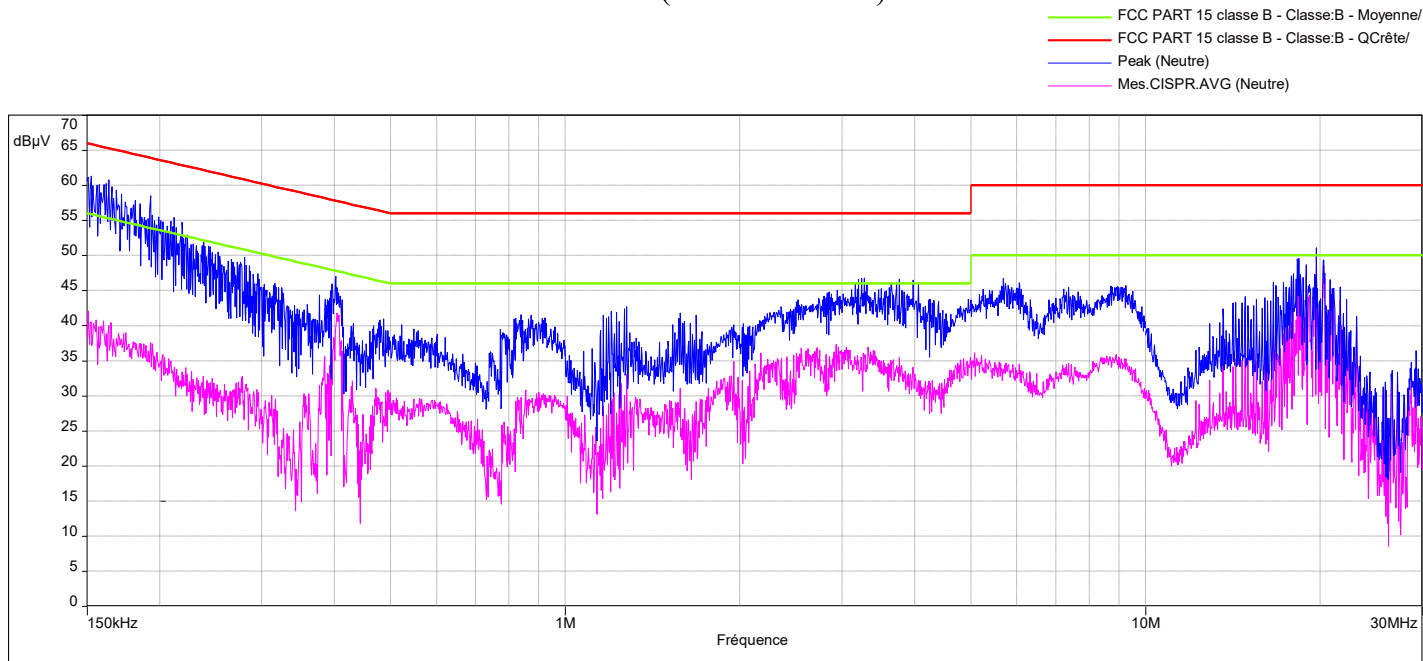
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	63.8	-	66	34.8	43.2	66	22.8
0.406	42.5	-	57.8	15.3	40.8	47.8	7
1.27	42.3	-	56	13.7	30.5	46	15.5
13.56	59.5	-	60	0.5	58.9	50	-8.9
18.24	50.9	-	60	9.1	49.8	50	0.2

Diagram N°13
Mode POE – 240V-50Hz
Phase (without antenna)



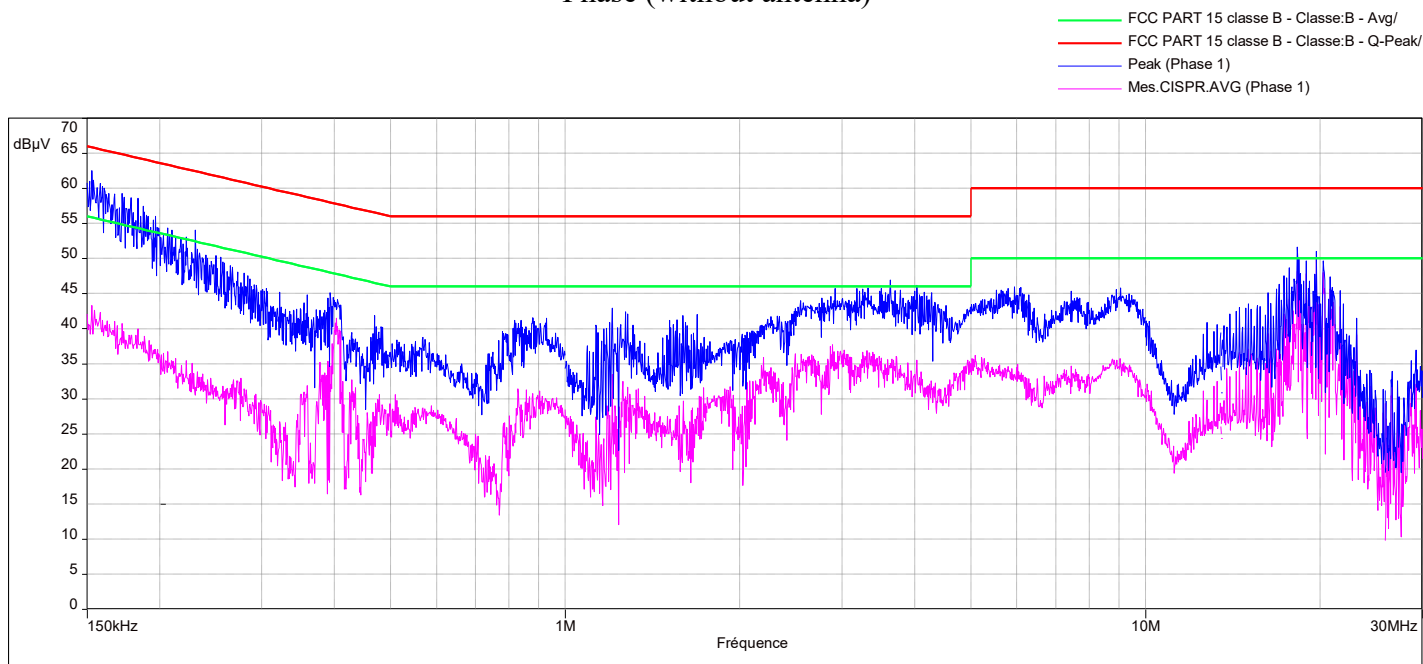
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
150	61.6	-	66	34.8	38.7	56	17.3
0.406	43.2	-	57.8	14.6	41.5	47.8	6.3
3.28	45.99	-	56	10.01	38.1	46	7.9
15	44.47	-	60	15.53	37.2	50	12.8
19.71	51	-	60	9	50	50	0

Diagram N°14
 Mode POE – 240V-50Hz
 Nneutral (without antenna)



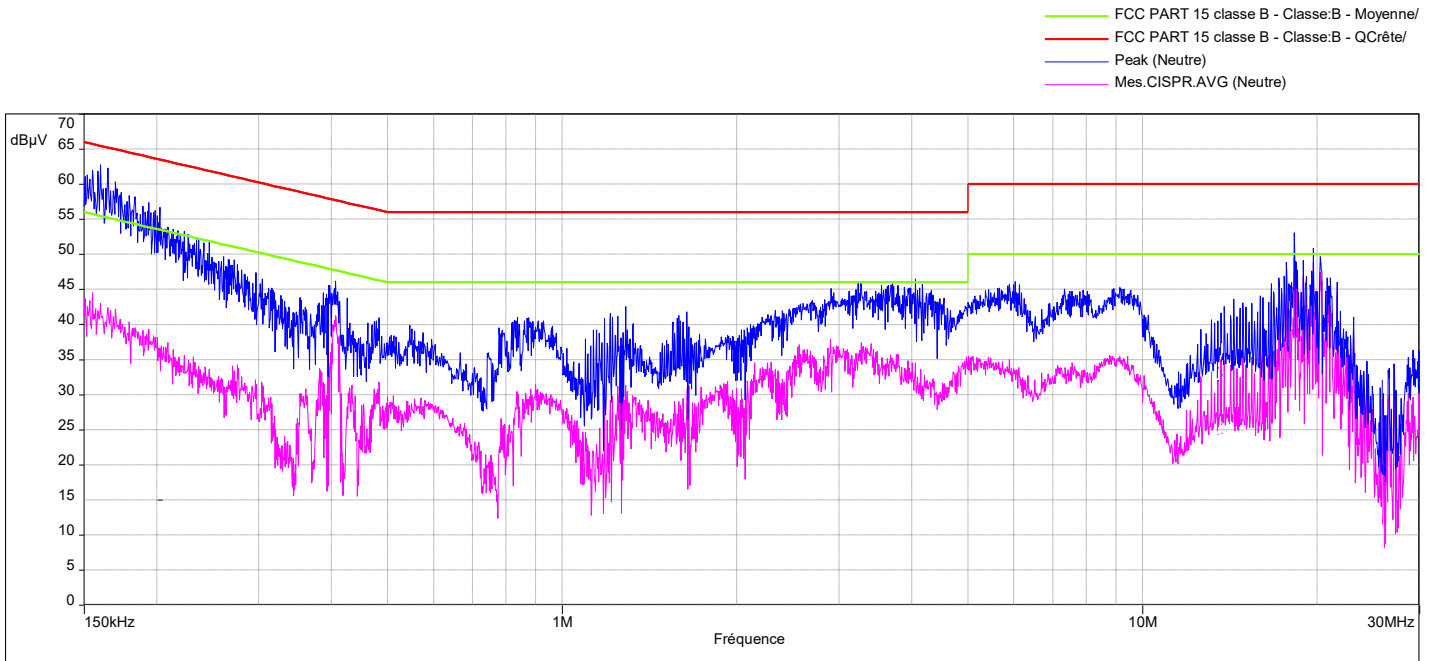
Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	61.7	-	66	34.8	42.2	56	13.8
0.406	45.3	-	57.8	12.5	41.8	47.8	6
3.27	46.7	-	56	9.3	35.4	46	10.6
18.24	49.48	-	60	10.52	46.76	50	3.24
20.25	49.3	-	60	10.7	48.48	50	1.52

Diagram N°15
 Mode POE – 120V-60Hz
 Phase (without antenna)



Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	60.7	-	66	34.8	42	56	14
0.403	42.7	-	57.8	15.1	41.5	47.6	6.1
2.88	43.1	-	56	12.9	37.8	46	8.2
13.81	40.2	-	60	19.8	34.2	50	15.8
18.24	51.59	-	60	8.41	48.1	50	1.9

Diagram N°16
Mode POE – 120V-60Hz
Neutral (without antenna)



Frequency (MHz)	Peak Level (dBμV)	Quasi-Peak Level (dBμV)	Quasi-Peak Limit (dBμV)	Margin peak/Quasi Peak (dB)	Average Level (dBμV)	Average Limit (dBμV)	Margin Avg/Avg (dB)
0.15	61.1	-	66	34.8	43.6	56	12.4
0.403	42.6	-	57.8	15.2	41	47.8	6.8
1.24	41.2	-	56	14.8	30.6	46	15.4
9.43	44.2	-	60	15.8	35.5	50	14.5
18.24	53	-	60	7	49.4	50	0.6

6.7. CONCLUSION

AC Power Line Conducted Emission measurement performed on the sample of the product **MPH-AC008A**, Sn: **2338SMK0000139**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.225 & RSS Gen** limits.

7. FIELD STRENGTH OUTSIDE OF THE BANDS 13.110-14.010 MHz

7.1. TEST CONDITIONS

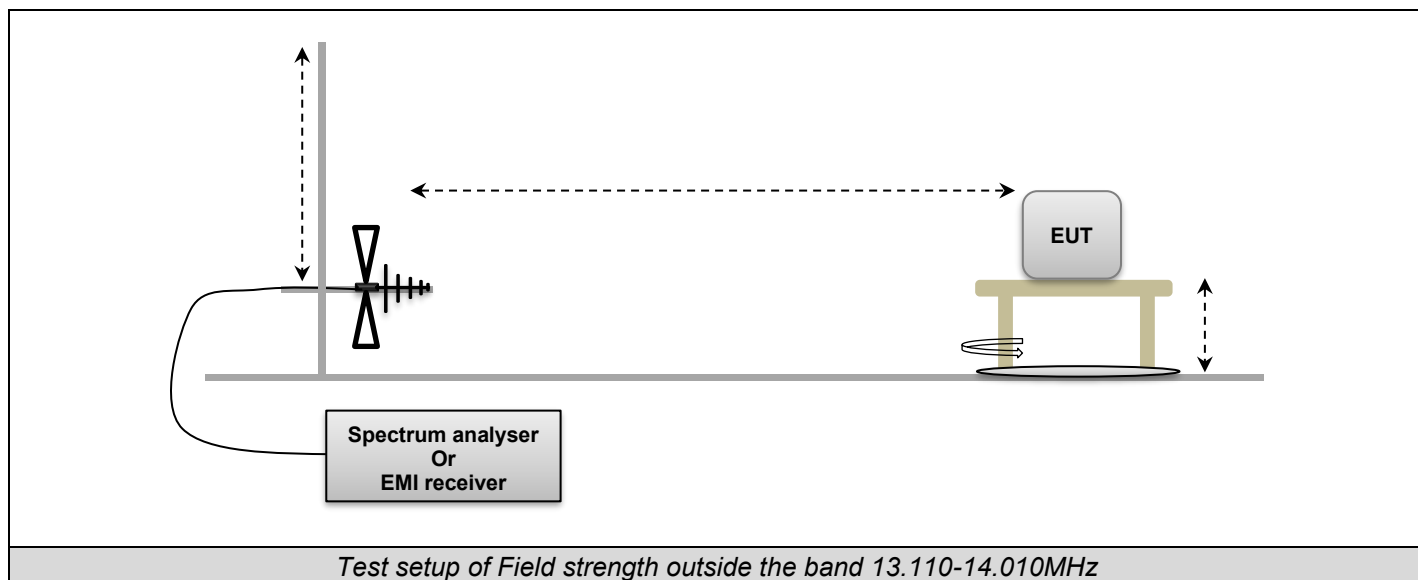
Date of test : 27th to 28th september, 2023
 Test performed by : Laurent Deneux
 Atmospheric pressure (hPa) : -
 Relative humidity (%) : 20 to 25
 Ambient temperature (°C) : 37 to 43

7.2. TEST SETUP

Test procedure: ☒ ANSI C63.10 & FCC Part 15 subpart C

Following frequency ranges, test setup parameters are different and specified in this table:

Frequency range :	Below 30MHz	From 30MHz to 1GHz	Above 1GHz
Antenna Polarization :	Parallel, Perpendicular And Ground parallel	Horizontal And Vertical	Horizontal And Vertical
Antenna Height :	1m	Varied from 1m to 4m	Centered on EUT (§6.6.5 ANSI C63-10)
Antenna Type :	Loop	Bi-Log	Horn
RBW Filter :	200Hz below 150kHz 9kHz above 150kHz	120kHz	1MHz
Maximization :	Turntable rotation of 360 degrees range		
EUT height :	0.8m		1.5m
Test site :	Open Area Test Site	Open Area Test Site	Semi-Anechoic Chamber
Distance EUT-Antenna :	3m	10m	3m



Same setup is used in semi anechoic chamber during pre-characterization, with a distance of 3m between EUT and antenna.



Photo of Field strength outside the band 13.110-14.010MHz

7.3. LIMIT

Measure at 300m		
Frequency range	Level	Detector
9kHz-490kHz	67.6dB μ V/m /F(kHz)	QPeak
Measure at 30m		
Frequency range	Level	Detector
490kHz-1.705MHz	87.6dB μ V/m /F(kHz)	QPeak
1.705MHz-30MHz	29.5dB μ V/m	QPeak
Measure at 10m		
Frequency range	Level	Detector
30MHz to 88MHz	29.5dB μ V/m	QPeak
88MHz to 216MHz	33dB μ V/m	QPeak
216MHz to 960MHz	35.5dB μ V/m	QPeak
960MHz to 1000MHz	43.5dB μ V/m	QPeak
Above 1000MHz	63.5dB μ V/m	Peak
	43.5dB μ V/m	Average
Measure at 3m		
Frequency range	Level	Detector
30MHz to 88MHz	40dB μ V/m	QPeak
88MHz to 216MHz	43.5dB μ V/m	QPeak
216MHz to 960MHz	46B μ V/m	QPeak
960MHz to 1000MHz	54dB μ V/m	QPeak
Above 1000MHz	74dB μ V/m	Peak
	54dB μ V/m	Average



7.4. TEST EQUIPMENT LIST

Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
OATS	-	-	F2000400	2023/03	2024/03
Receiver	ROHDE & SCHWARZ	ESU	A2642018	2023/03	2025/03
Preamplifier	BONN	BLNA 3018-8F305	A7080053	2021/11	2023/11
Horn antenna	EMCO	3115	C2042023	2022/01	2024/01
Cable			A5329442	2022/11	2023/11
Cable	-	-	A5330071	2023/05	2024/05
Cable	-	-	A5329948	2022/12	2023/12
Cable	-	-	75330072	2023/05	2024/05
Antenne bico	Schwarzbeck	VHBB9124 + BBA 9106	C2040295	2023/02	2025/02
dipole	ROHDE & SCHWARZ	HUF-Z1	C2040011	2022/05	2024/05
logperiodique	ROHDE & SCHWARZ	HL 023 A2	C2040001	2022/05	2024/05
Cable	-	-	A5330070	2023/05	2024/05
Loop antenna	Schwarzbeck	FMZB	C2040209	2022/10	2024/10
Software V3.21.0.9	NEXIO	BAT-EMC	-	-	-

7.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

7.6. RESULTS

Mode DC

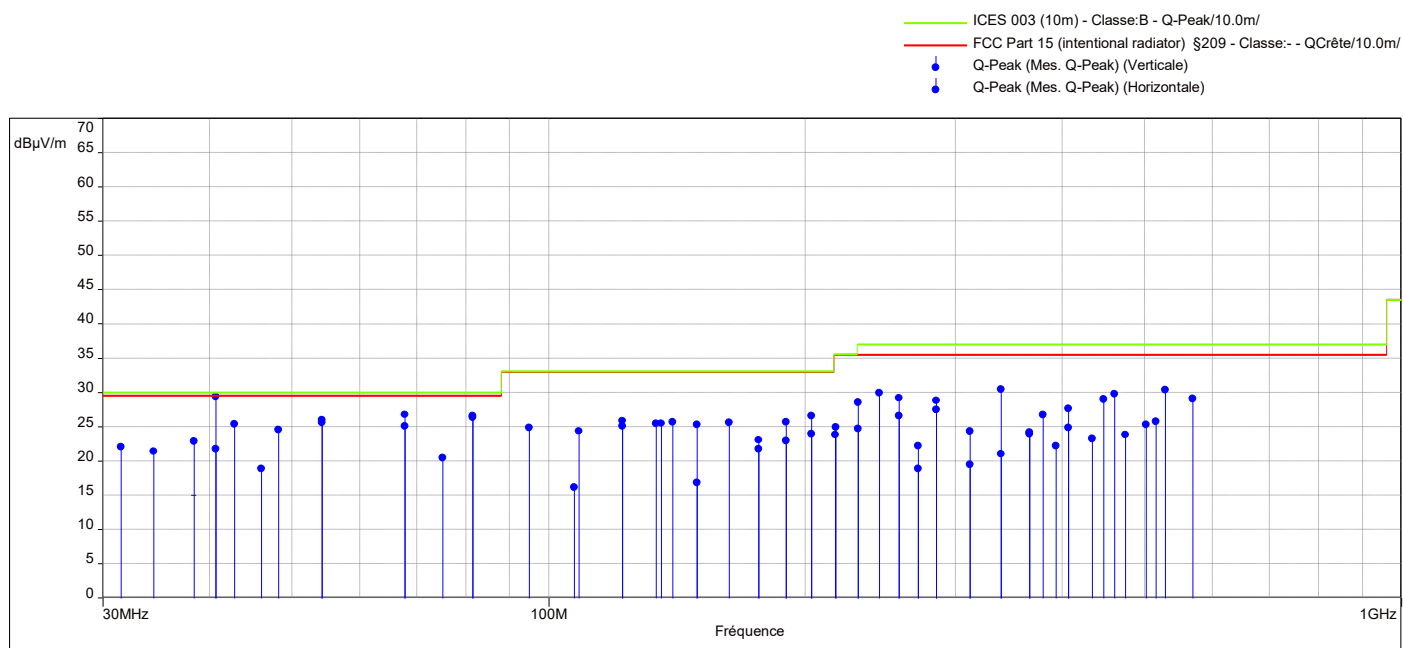
7.6.1. 9kHz to 30MHz

<i>Frequency (MHz)</i>	<i>Perpendicular/ parallel</i>	<i>Measure (dBμV/m)</i>	<i>Limit (dBμV/m)</i>	<i>Margin</i>
8.18	Perpendicular	30.01	69.5	39.49
8.52	Perpendicular	28.46	69.5	41.04
9.05	Perpendicular	26.99	69.5	42.51
11.97	Perpendicular	25	69.5	44.5
15.56	Perpendicular	25.81	69.5	43.69
16.08	Perpendicular	27.29	69.5	42.21
16.61	Perpendicular	25.13	69.5	44.37
16.96	Perpendicular	29.11	69.5	40.39
17.31	Perpendicular	25.19	69.5	44.31
17.84	Perpendicular	26.18	69.5	43.32
18.54	Perpendicular	25.44	69.5	44.06
19.24	Perpendicular	27.61	69.5	41.89
25.93	Perpendicular	26.54	69.5	42.96
26.45	Perpendicular	25.32	69.5	44.18
27.12	Perpendicular	43.5	69.5	23
28.04	Perpendicular	24.31	69.5	45.19
28.56	Perpendicular	25.26	69.5	44.24
29.09	Perpendicular	24.63	69.5	44.87
29.54	Perpendicular	28.72	69.5	40.78
18.89	parallel	30.91	69.5	38.59
19.60	parallel	31.08	69.5	38.42
20.13	parallel	33.77	69.5	35.73
20.30	parallel	32.32	69.5	37.18
20.83	parallel	29.89	69.5	39.61
21.36	parallel	26.61	69.5	42.89
27.11	parallel	44.5	69.5	25
29.51	parallel	23.01	69.5	46.49
27.14	Ground parallel	35.7	69.5	33.7
28.04	Ground parallel	28.1	69.5	41.4
28.61	Ground parallel	27.4	69.5	42.1
29.1	Ground parallel	27	69.5	42.5
29.45	Ground parallel	26.5	69.5	43
29.87	Ground parallel	26.7	69.5	42.8

Frequency (MHz)	Perpendicular/ parallel	Measure (dBμA/m)	Limit (dBμA/m)	Margin
8.18	Perpendicular	-21.49	18.06	39.55
8.52	Perpendicular	-23.04	18.06	41.1
9.05	Perpendicular	-24.51	18.06	42.57
11.97	Perpendicular	-26.5	18.06	44.56
15.56	Perpendicular	-25.69	18.06	43.75
16.08	Perpendicular	-24.21	18.06	42.27
16.61	Perpendicular	-26.37	18.06	44.43
16.96	Perpendicular	-22.39	18.06	40.45
17.31	Perpendicular	-26.31	18.06	44.37
17.84	Perpendicular	-25.32	18.06	43.38
18.54	Perpendicular	-26.06	18.06	44.12
19.24	Perpendicular	-23.89	18.06	41.95
25.93	Perpendicular	-24.96	18.06	43.02
26.45	Perpendicular	-26.18	18.06	44.24
27.12	Perpendicular	-8	18.06	26.06
28.04	Perpendicular	-27.19	18.06	45.25
28.56	Perpendicular	-26.24	18.06	44.3
29.09	Perpendicular	-26.87	18.06	44.93
29.54	Perpendicular	-22.78	18.06	40.84
18.89	parallel	-20.59	18.06	38.65
19.60	parallel	-20.42	18.06	38.48
20.13	parallel	-17.73	18.06	35.79
20.30	parallel	-19.18	18.06	37.24
20.83	parallel	-21.61	18.06	39.67
21.36	parallel	-24.89	18.06	42.95
27.11	parallel	-7	18.06	25.06
29.51	parallel	-28.49	18.06	46.55
27.14	Ground parallel	-15.8	18.06	33.86
28.04	Ground parallel	-23.4	18.06	41.46
28.61	Ground parallel	-24.1	18.06	42.16
29.1	Ground parallel	-24.5	18.06	42.56
29.45	Ground parallel	-25	18.06	43.06
29.87	Ground parallel	-24.8	18.06	42.86

7.6.2. 30MHz to 1GHz

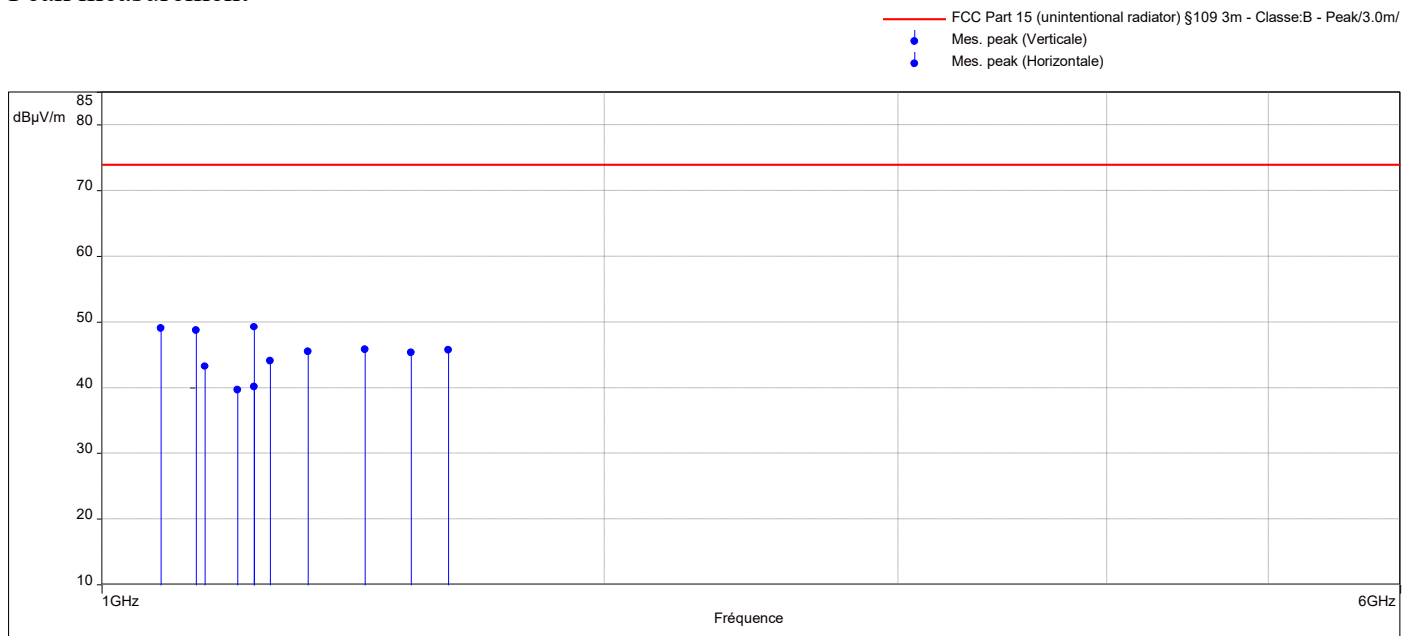
Quasi peak measurement



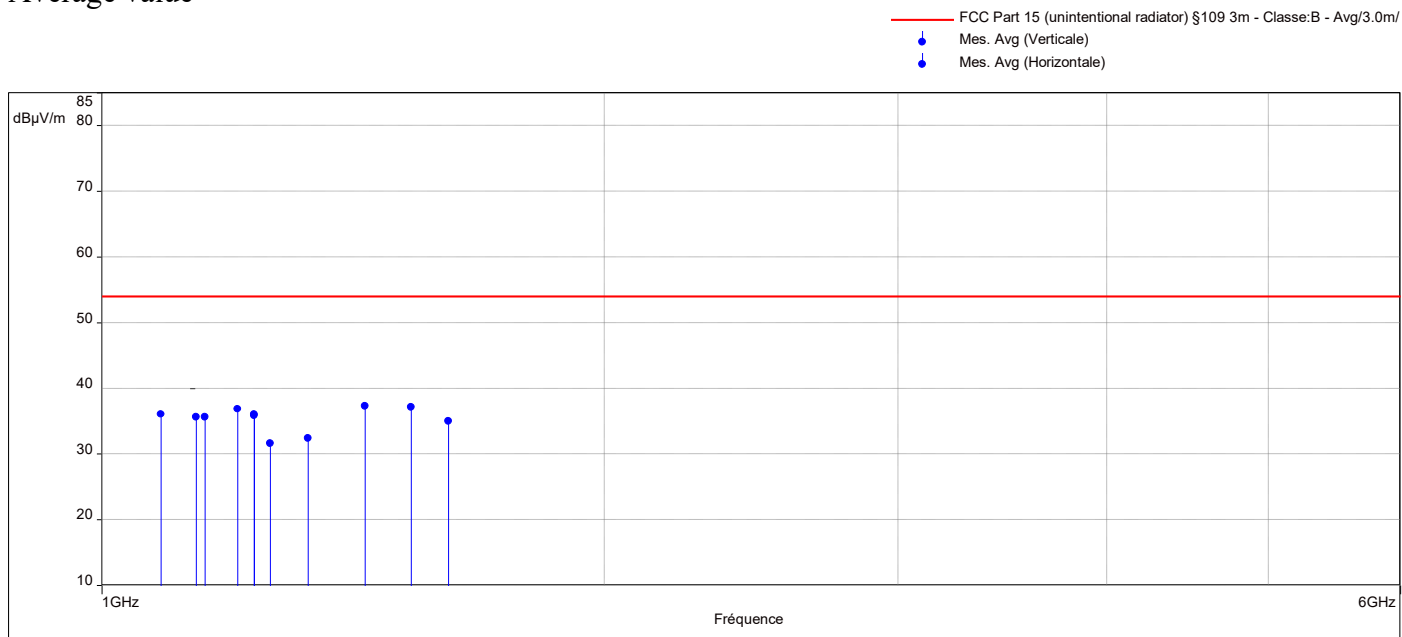
Polarity	Frequency (MHz)	level (dBμV/m)	limit ICES-003 class B	Margin/ ICES-003 class B	limit FCC class B	Margin/ Fcc Part class B
Vertical	31.5	22.06	30	7.94	29.5	7.44
Vertical	40.67	29.35	30	0.65	29.5	0.15
Vertical	54.24	25.96	30	4.04	29.5	3.54
Vertical	67.8	26.81	30	3.19	29.5	2.69
Vertical	81.35	26.54	30	3.46	29.5	2.96
Vertical	189.8	25.69	33.1	7.41	33	7.31
Vertical	244.07	29.92	37	7.08	35.5	5.58
Vertical	339	30.41	37	6.59	35.5	5.09
Vertical	447.5	29.02	37	7.98	35.5	6.48
Vertical	528.83	30.35	37	6.65	35.5	5.15
Vertical	569.5	29.1	37	7.9	35.5	6.4
Horizontal	67.8	25.04	30	4.96	29.5	4.46
Horizontal	81.35	26.32	30	3.68	29.5	3.18
Horizontal	162.7	25.55	33.1	7.55	33	7.45
Horizontal	203.4	26.58	33.1	6.52	33	6.42

7.6.3. 1GHz to 6GHz

Peak measurement



Average value





Polarity	Frequency (MHz)	level peak (dB μ V/m)	level average (dB μ V/m)	limit peak FCC class B	Margin peak / Fcc Part class B	limit average FCC class B	Margin Average / Fcc Part class B
Vertical	1139	48.74	35.67	74	25.26	54	18.33
Vertical	1233.96	49.26	36.02	74	24.74	54	17.98
Vertical	1261.08	44.11	31.62	74	29.89	54	22.38
Vertical	1328.88	45.53	32.37	74	28.47	54	21.63
Vertical	1437.6	45.8	37.28	74	28.2	54	16.72
Vertical	1532.28	45.34	37.13	74	28.66	54	16.87
Horizontal	1084.8	49.05	36.08	74	24.95	54	17.92
Horizontal	1152.6	43.27	35.67	74	30.73	54	18.33
Horizontal	1205.9	39.68	36.86	74	34.32	54	17.14
Horizontal	1234	40.1	35.9	74	33.9	54	18.1
Horizontal	1613.6	45.7	34.99	74	28.3	54	19.01

Mode POE

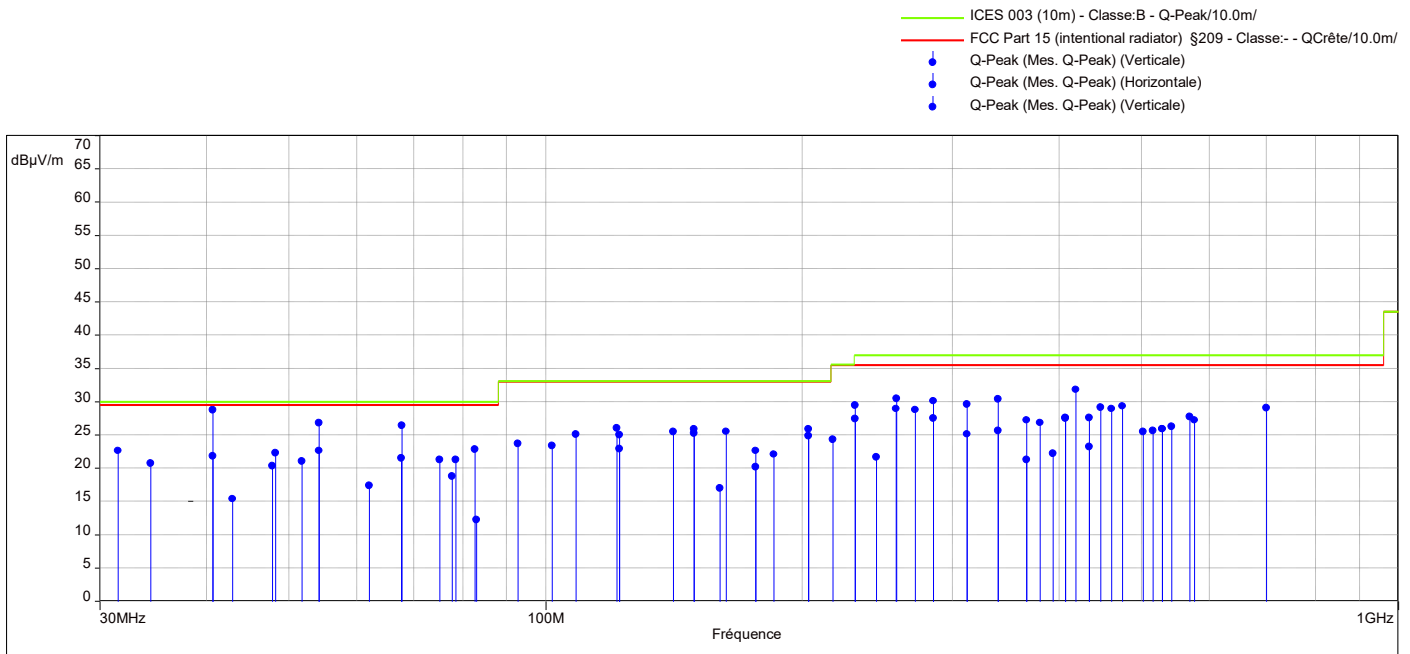
7.6.4. 9kHz to 30MHz

Frequency (MHz)	Perpendicular/parallel	Measure (dB μ V/m)	Limit (dB μ V/m)	Margin
5.25	Perpendicular	22.35	69.5	47.15
5.79	Perpendicular	23.81	69.5	45.69
6.49	Perpendicular	28.03	69.5	41.47
7.56	Perpendicular	30.43	69.5	39.07
8.59	Perpendicular	25.24	69.5	44.26
10.79	Perpendicular	24.49	69.5	45.01
12.19	Perpendicular	25.79	69.5	43.71
16.22	Perpendicular	24.35	69.5	45.15
17.28	Perpendicular	23.51	69.5	45.99
18.17	Perpendicular	26.18	69.5	43.32
19.57	Perpendicular	23.61	69.5	45.89
23.06	Perpendicular	23.1	69.5	46.4
27.11	Perpendicular	39	69.5	30.5
28.42	Perpendicular	24.1	69.5	45.4
28.95	Perpendicular	26.03	69.5	43.47
29.65	Perpendicular	27.81	69.5	41.69
10.612	parallel	26.64	69.5	42.86
11.04	parallel	24.38	69.5	45.12
14.82	parallel	24.95	69.5	44.55
15.89	parallel	23.73	69.5	45.77
16.77	parallel	25.54	69.5	43.96
17.28	parallel	26.14	69.5	43.36
17.64	parallel	29.03	69.5	40.47
18.34	parallel	26.41	69.5	43.09
19.04	parallel	23.86	69.5	45.64
19.74	parallel	27.16	69.5	42.34
27.12	parallel	38.5	69.5	31
17.25	Ground parallel	29.7	69.5	39.8
18.18	Ground parallel	30.2	69.5	39.3
27.11	Ground parallel	45.5	69.5	24
27.56	Ground parallel	29.8	69.5	39.7
28.04	Ground parallel	29.5	69.5	40
28.41	Ground parallel	29.1	69.5	40.4
28.89	Ground parallel	28.35	69.5	41.15

Frequency (MHz)	Perpendicular/parallel	Measure (dBμA/m)	Limit (dBμA/m)	Margin
5.25	Perpendicular	-29.15	18.06	47.21
5.79	Perpendicular	-27.69	18.06	45.75
6.49	Perpendicular	-23.47	18.06	41.53
7.56	Perpendicular	-21.07	18.06	39.13
8.59	Perpendicular	-26.26	18.06	44.32
10.79	Perpendicular	-27.01	18.06	45.07
12.19	Perpendicular	-25.71	18.06	43.77
16.22	Perpendicular	-27.15	18.06	45.21
17.28	Perpendicular	-27.99	18.06	46.05
18.17	Perpendicular	-25.32	18.06	43.38
19.57	Perpendicular	-27.89	18.06	45.95
23.06	Perpendicular	-28.4	18.06	46.46
27.11	Perpendicular	-12.5	18.06	30.56
28.42	Perpendicular	-27.4	18.06	45.46
28.95	Perpendicular	-25.47	18.06	43.53
29.65	Perpendicular	-23.69	18.06	41.75
10.612	parallel	-24.86	18.06	42.92
11.04	parallel	-27.12	18.06	45.18
14.82	parallel	-26.55	18.06	44.61
15.89	parallel	-27.77	18.06	45.83
16.77	parallel	-25.96	18.06	44.02
17.28	parallel	-25.36	18.06	43.42
17.64	parallel	-22.47	18.06	40.53
18.34	parallel	-25.09	18.06	43.15
19.04	parallel	-27.64	18.06	45.7
19.74	parallel	-24.34	18.06	42.4
27.12	parallel	-13	18.06	31.06
17.25	Ground parallel	-21.8	18.06	39.86
18.18	Ground parallel	-21.3	18.06	39.36
27.11	Ground parallel	-6	18.06	24.06
27.56	Ground parallel	-21.7	18.06	39.76
28.04	Ground parallel	-22	18.06	40.06
28.41	Ground parallel	-22.4	18.06	40.46
28.89	Ground parallel	-23.15	18.06	41.21

7.6.5. 30MHz to 1GHz

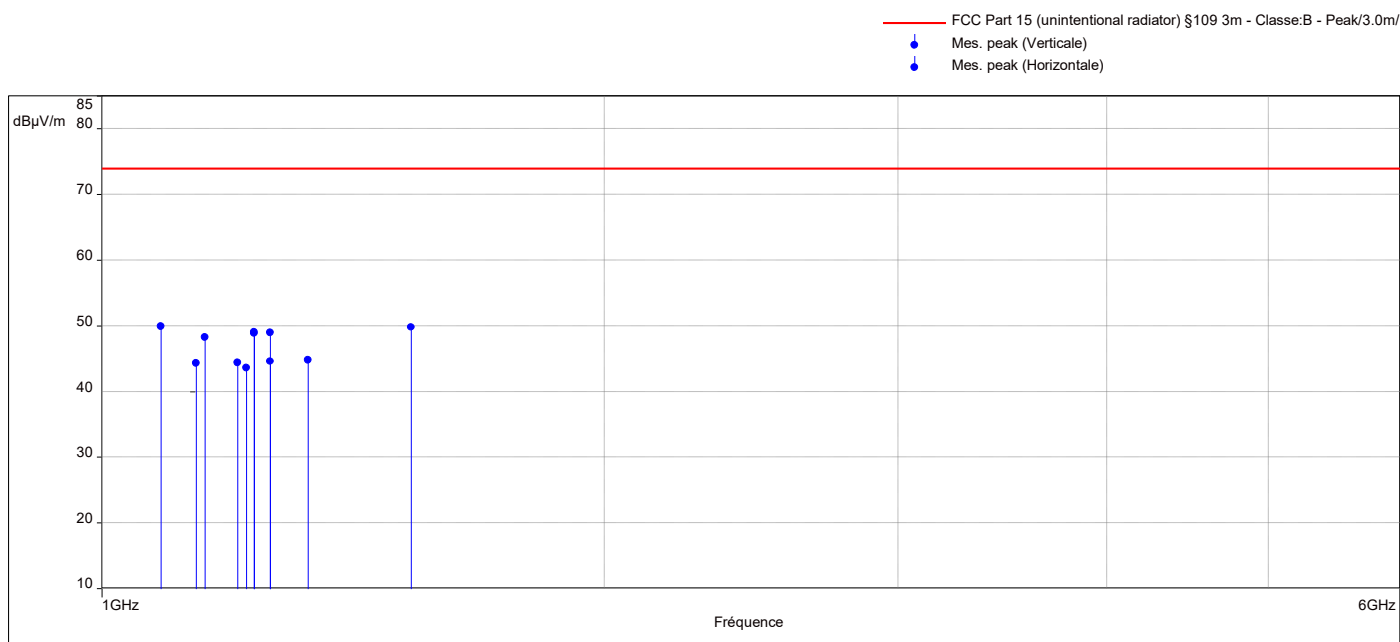
Quasi peak measurement



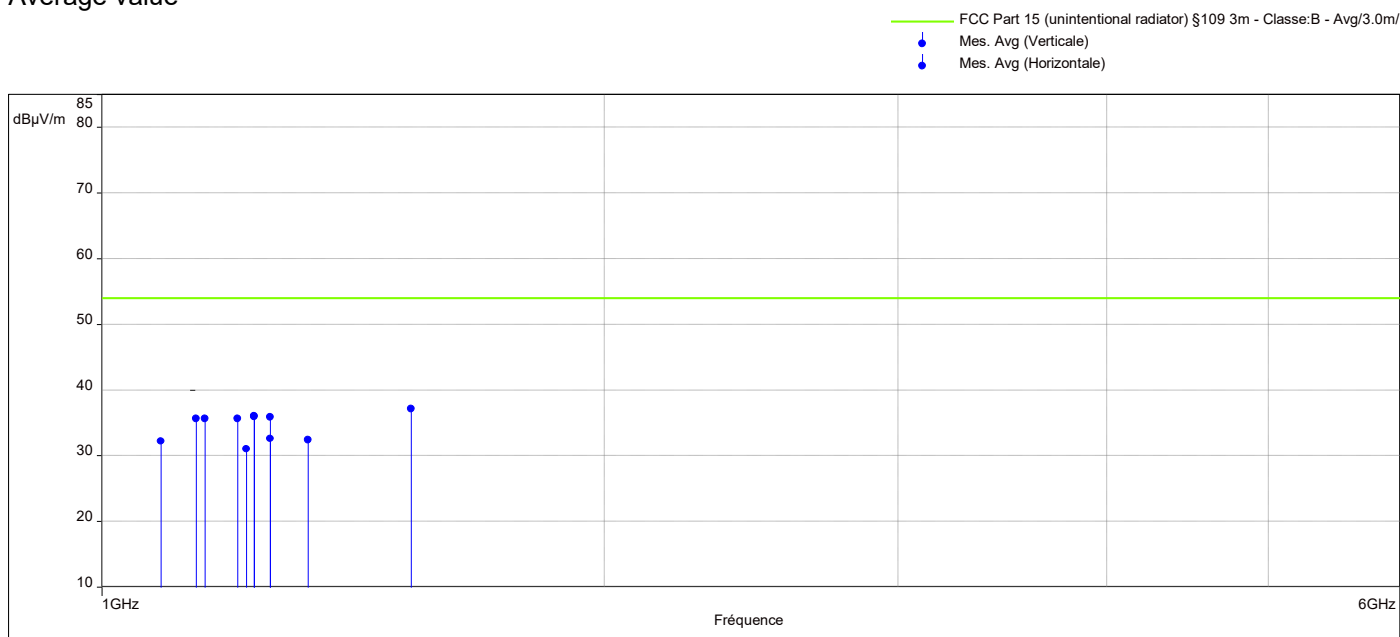
Polarity	Frequency (MHz)	level (dBμV/m)	limit ICES-003 class B	Margin/ ICES-003 class B	limit FCC class B	Margin/ Fcc Part class B
Vertical	40.7	28.8	30	1.2	29.5	0.7
Vertical	54.24	26.76	30	3.24	29.5	2.74
Vertical	67.8	26.38	30	3.62	29.5	3.12
Vertical	122	25.02	33.1	8.08	33	7.98
Vertical	141.1	25.5	33.1	7.6	33	7.5
Vertical	149.2	25.82	33.1	7.28	33	7.18
Vertical	203.4	25.89	33.1	7.21	33	7.11
Vertical	418.1	31.85	37	5.15	35.5	3.65
Horizontal	108.5	25.08	33.1	8.02	33	7.92
Horizontal	121.1	25.99	33.1	7.11	33	7.01
Horizontal	162.7	25.5	33.1	7.6	33	7.5
Horizontal	203.4	24.82	33.1	8.28	33	8.18
Horizontal	338.99	30.3	37	6.7	35.5	5.2
Horizontal	854.3	31.07	37	5.93	35.5	4.43

7.6.6. 1GHz to 6GHz

Peak measurement



Average value



Polarity	Frequency (MHz)	level peak (dBµV/m)	level average (dBµV/m)	limit peak FCC class B	Margin peak Fcc Part class B	limit verage FCC class B	Margin Average Fcc Part class B
Vertical	1139	44.28	35.65	74	29.72	54	18.35
Vertical	1234	49.07	36.01	74	24.93	54	17.99
Vertical	1261.1	44.66	35.91	74	29.34	54	18.09
Vertical	1328.9	44.82	32.37	74	29.18	54	21.63
Vertical	1532.3	49.82	37.11	74	24.18	54	16.89
Horizontal	1084.8	49.94	32.28	74	24.06	54	21.72
Horizontal	1152.6	48.29	35.68	74	25.71	54	18.32
Horizontal	1205.9	44.43	35.64	74	29.57	54	18.36
Horizontal	1220.4	43.58	31.05	74	30.42	54	22.95
Horizontal	1234	48.9	35.92	74	25.1	54	18.08
Horizontal	1261.1	48.97	32.66	74	25.03	54	21.34

7.7. CONCLUSION

Field strength outside of the bands 13.110-14.010 MHz measurement performed on the sample of the product **MPH-AC008A**, Sn: **2338SMK0000139**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.225 & RSS-Gen** limits.



8. IELD STRENGTH WITHIN THE BAND 13.110-14.010MHz

8.1. TEST CONDITIONS

Date of test : October 28, 2023
Test performed by : Laurent Deneux
Atmospheric pressure (hPa) : -
Relative humidity (%) : 21
Ambient temperature (°C) : 41

8.2. TEST SETUP

The Equipment Under Test is installed **on an Open Area Test Site..**
Measurement is performed with a spectrum analyzer in **radiated method.**

Test Procedure:

☒ ANSI C63.10

The EUT is placed **on an open area test site**. Distance between measuring antenna and the EUT is **10m**. Test is performed in parallel, perpendicular, and ground parallel axis with a loop antenna below 30MHz. Measurement bandwidth was 9kHz between 150kHz & 30MHz. The level has been maximized by the turntable rotation of 360 degrees range on all axis of EUT used in normal configuration. Antenna height search was performed from 1 to 4m. The EUT is place at **0.8m**.

Ambient temperature: 21 °C

Relative humidity: 41 %

Note: It is impracticable to carry out tests under normal condition as specified in standard.

When measurement with test fixture is used, the power level calibration of the spectrum analyzer shall then be related to the power level or field strength measured with temperature during OATS measure taking in consideration in climatic chamber. The calculation will be used to calculate the absolute level of the sideband power.

Frequency band 13.110-14.010MHz

Following plots show radiated emission level in the frequency band 13.110-14.010MHz with a RBW of 9kHz and a quasi-peak detector. The graphs are obtained with a measuring receiver.



Test setup of Field strength within the band 13.110-14.010MHz in OATS



Photo of Field strength within the band 13.110-14.010MHz in OATS



8.3. LIMIT

Frequency (MHz)	Field strength ($\mu\text{V/m}$) @30m	Field strength ($\text{dB}\mu\text{V/m}$) @30m	Field strength ($\text{dB}\mu\text{V/m}$) @3m
13.553-13.567	15 848	84.0	124.0
13.410-13.553 13.567-13.710	334.0	50.5	90.5
13.110-13.410 13.710-14.010	106.0	40.5	80.5
Below 13.110MHz Above 14.010MHz	30.0	29.5	69.5

8.4. TEST EQUIPMENT LIST

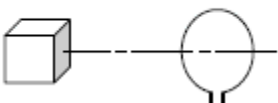
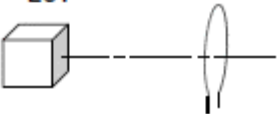
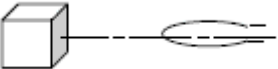
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Receiver	ROHDE & SCHWARZ	ESU	A2642018	2023/03	2025/03
Cable	-	-	A5329442	2022/11	2023/11
Loop antenna	R&S	HFH2-Z2	C2040269	2022/12	2024/12
Cable	-	-	A5330071	2023/05	2024/05
Loop antenna	Schwarzbeck	FMZB	C2040209	2022/10	2024/10
Software V3.19.1.21	NEXIO	BAT-EMC	-	-	-

8.5. DIVERGENCE, ADDITION OR SUPPRESSION ON THE TEST SPECIFICATION

None

8.6. RESULTS

8.6.1. Results on OATS test conditions:

Frequency (MHz)	QPeak Limit (dB μ V/m) @ 30m	QPeak (dB μ V/m) @ 30m	Margin (Mes-Lim) (dB)	Angle Table (deg)	Pol Ant.	Ht Ant. (cm)	Correc. Factor (dB)	Comments
13.56								
 Parallel Axis (0°)  Perpendicular Axis (90°)  Ground Parallel Axis (180°)								

Note: Measure have been done at 10m distance and corrected according to requirements of 15.209.e) ($M@30m = M@10m - 19.1dB$)

8.6.2. Results under Normal condition

DC mode

Parallel Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	32.5	69.5
13.110 to 13.410	-	35.4	80.5
13.410 to 13.553	--	39.8	90.5
13.553 to 13.567	-	66.1	124.0
13.567 to 13.710	-	38.9	90.5
13.710 to 14.010	-	36.5	80.5
Above 14.010	-	33.2	69.5

Ground Parallel Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	33.2	69.5
13.110 to 13.410	-	34.9	80.5
13.410 to 13.553	-	36.6	90.5
13.553 to 13.567	-	59.9	124.0
13.567 to 13.710	-	37.4	90.5
13.710 to 14.010	-	34.7	80.5
Above 14.010	-	31.2	69.5

Perpendicular Axis			
Frequency (MHz)	Peak Level (dB μ V/m) (3m)	QPeak Level (dB μ V/m) (3m)	Limit (dB μ V/m) (3m)
Below 13.110	-	30.2	69.5
13.110 to 13.410	-	32.5	80.5
13.410 to 13.553	-	35.4	90.5
13.553 to 13.567	-	57	124
13.567 to 13.710	-	36.5	90.5
13.710 to 14.010	-	34.2	80.5
Above 14.010	-	31.2	69.5

POE mode

Parallel Axis			
Frequency (MHz)	Peak Level (dBµV/m) (3m)	QPeak Level (dBµV/m) (3m)	Limit (dBµV/m) (3m)
Below 13.110	-	30.9	69.5
13.110 to 13.410	-	33.4	80.5
13.410 to 13.553	--	36.3	90.5
13.553 to 13.567	-	64.4	124.0
13.567 to 13.710	-	38.4	90.5
13.710 to 14.010	-	35.8	80.5
Above 14.010	-	32.5	69.5

Ground Parallel Axis			
Frequency (MHz)	Peak Level (dBµV/m) (3m)	QPeak Level (dBµV/m) (3m)	Limit (dBµV/m) (3m)
Below 13.110	-	32.4	69.5
13.110 to 13.410	-	34.8	80.5
13.410 to 13.553	-	38.1	90.5
13.553 to 13.567	-	59.4	124.0
13.567 to 13.710	-	36.5	90.5
13.710 to 14.010	-	34.8	80.5
Above 14.010	-	33.5	69.5

Perpendicular Axis			
Frequency (MHz)	Peak Level (dBµV/m) (3m)	QPeak Level (dBµV/m) (3m)	Limit (dBµV/m) (3m)
Below 13.110	-	31.1	69.5
13.110 to 13.410	-	33.6	80.5
13.410 to 13.553	-	38.7	90.5
13.553 to 13.567	-	58.4	124
13.567 to 13.710	-	37.4	90.5
13.710 to 14.010	-	35.9	80.5
Above 14.010	-	32.4	69.5

8.7. CONCLUSION

Field strength within the band 13.110-14.010MHz measurement performed on the sample of the product **MPH-AC008A**, Sn: **2338SMK0000139**, in configuration and description presented in this test report, show levels **compliant** to the **47 CFR PART 15.225 & RSS 210** limits.

9. UNCERTAINTIES CHART

<i>Kind of measurement</i>	<i>Wide uncertainty laboratory</i>
Occupied Channel Bandwidth	±2.8 %
Humidity	±3.2 %
Power Spectral Density, Conducted	±1.7 dB
Radio frequency	±0.3 ppm
RF power, conducted	±1.2 dB
RF power, radiated (Full anechoic chamber above 1GHz)	±3.7 dB
RF power, radiated (Semi anechoic chamber & open test site)	±5.6 dB
Spurious emission, conducted	±2.3 dB
Spurious emission, radiated (Full anechoic chamber above 1GHz)	±3.8 dB
Spurious emission, radiated (Semi anechoic chamber & open test site)	±5.7 dB
Temperature	±0.75 °C
Time	±2.3 %
Voltage	±1.7 %

The uncertainty values calculated by the laboratory are lower than limit uncertainty values defined by the CISPR. The conformity of the sample is directly established by the applicable limit values. This table includes all uncertainties maximum feasible for testing in the laboratory, whether or not made in this report.